inter M

The Industry Standard.

The Industry Standard for Commercial Sound

www.inter-m.uk.com

Introduction

CIE-Group – one of the UK's most experienced suppliers of high quality Commercial Sound and AV products – are the exclusive UK supply partner for Inter-M, having worked together for over 20 years and frequently being recognised as the most successful Inter-M partner in the world.

Over this period, Inter-M's Commercial Sound product range has been specified into many of the UK's leading system installations across the full spectrum of commercial and private sectors; building its enviable reputation as 'The Industry Standard' for Commercial Sound.

Within many of the retail sector's largest high street and supermarket chains, banks & building societies, airports, places of worship, hospitals and education, you'll find high quality, trusted PA and AV systems powered by Inter-M.

interM
The Industry Standard.

CIE-group
integrated system solutions

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'Inter-M - The Industry Standard in Commercial Sound'.

PLASA Professional Light & Sound Association
BESA British Educational Suppliers Association
ISCE Supporting Member
Certificate No. FS 31532

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Exclusive UK Supply Partners

CIE-Group are the exclusive UK supply partners for the complete **Inter-M** audio, visual and CCTV product range.

Key to CIE-Group's success is our absolute commitment to both the quality of product and service to our customers; reflected by our team of pre- and post-sales technical advisors, UK-based stockholding, service & repair and our Rack Design & Build Service – consistently producing some of the UK's highest quality, ready-to-install PA racks to your own specifications (see page 43 for further information).

The close relationship between Inter-M, our customers and CIE-Group also ensures direct access to an expert team of sales, training and technical advisers, as well as showroom and demonstration facilities…

Engineering

CIE-Group's technical and after-sales service department provides system advice, service, repair and remanufacture facilities to ensure a unique UK-based, fast and efficient resource.

Demonstrations

Our dedicated team of sales and technical support staff are also on hand to provide full product and user training either at our own facilities or on-site.

Showroom

Our showroom, centrally located in Nottingham, gives customers and clients immediate access to over 200 of our key products.

Powered by Inter-M

Deafblind UK Headquarters

The headquarters of charity Deafblind UK has been designed as a 'model' facility for disabled access and use.

With large numbers of visitors to the building being hard of hearing, ensuring clarity of voice reproduction was an essential requirement of the design brief.

The solution involved a complex PA system, zoned for presentation/ meeting areas and for PA announcement throughout the building and powered by a bank of Inter-M A-120 amplifiers.

The system has now enhanced the teaching and conferencing facilities, allowing for greater flexibility and increased revenue for the charity from educational, corporate and private usage.

Halifax High Street Branches

The current trend for open plan layout 'retail banking' in the high street creates new privacy problems for customers wishing to discuss their personal finances.

Halifax Banks have overcome this problem using 'music masking' systems powered by Inter-M amplification. Used in branches throughout the UK, these systems provide low-level music and marketing messaging, ensuring conversations between customer and advisor are 'masked'; thereby restoring customer confidentiality.

Tesco Supermarkets

As part of their continuing expansion programme, Tesco are opening new branches of their superstores and 'Extra' stores throughout the UK.

Each store currently being launched uses an Inter-M powered PA system featuring 2 zones for public and staff areas and 5 digital message stores for public announcements.

Each Inter-M PA rack has been designed and built by CIE-Group and features PAM Series amplifiers, PA-9336 power amplifiers and PB9207A battery back-up.

PA-935A: 35W Mixer Amplifier

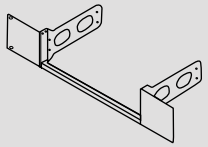
Simple, compact mixer amplifier ideal for use in smaller installations such as waiting rooms, offices, factories, educational and retail applications.

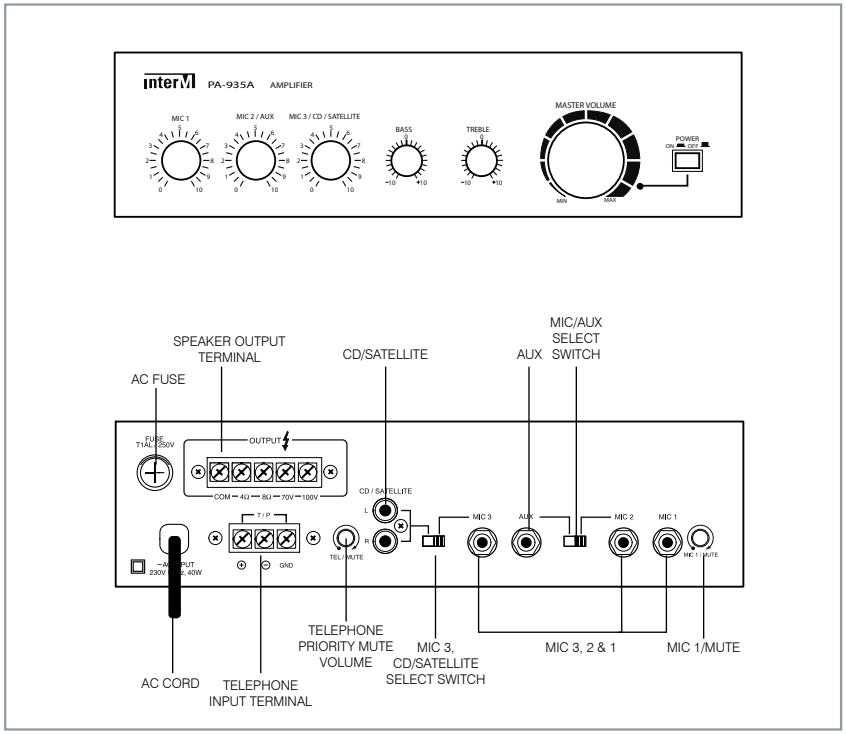
Provides clear voice and full range BGM reproduction.

Features:

- Compact design
- 1 Mic input (¼" jack)
- 2 Mic/AUX switchable (¼" jack/stereo phono)
- Priority inputs, telephone, mic 1
- Bass/treble control
- 100v/4Ω Low Z output option
- 8Ω/4Ω Low Z output option
- Optional 19" rack kit (BKT-PA935A)

19" Rack Mount Bracket Option: BKT-PA935A Bracket





Specifications:

Model:	PA-935A:
Output Power	35W RMS @ 100v/70v 35W RMS 8Ω/4Ω
Inputs	1 x Mic (¼" jack) 1 x Mic/Aux (¼" jack) 1 x Mic/Aux~Sat (¼" jack and stereo phono) 1 x Screw terminal (Tel)
Priority	Telephone, Mic 1
Input Sensitivity/Impedance	Mic 1,2,3 ~ -50dB/600Ω Aux ~ -15dB/10kΩ Sat ~ 0dB/10kΩ Telephone ~ 0.775v/600Ω
Frequency Response	80Hz~15KHz
Power Requirement	230v AC 50Hz
Dimensions	290(W) x 76(H) x 185(D)mm
Weight	4.4kg

PA-2000A / PA-4000A / PA-6000A: 60W, 120W, 240W Mixer Amplifiers

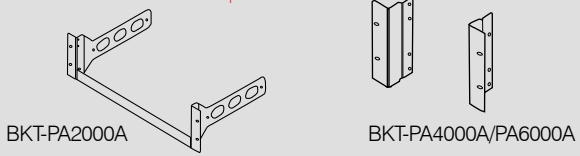
Ground breaking amplifier series which, when released, set new standards in the industry, its modern outlook and host of features pushed it to the forefront of the PA, education, AV and church markets, where it remains today!

Features:

- 6 Inputs (5 x 3 pin XLR, 1 x stereo phono)
- Telephone input (screw terminals)
- Priority-telephone, mic 1, mic 2
- 5 Band graphic equaliser
- Line in
- Line out
- 5 Zone speaker selection
- Chime~siren
- External mute terminal
- Bar graph LED output VU meter
- 3U high
- Optional 19" rack kits (BKT-PA2000A, BKT-PA4000A*)

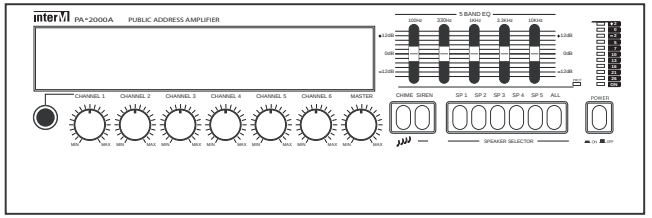
* Bracket also fits PA6000A

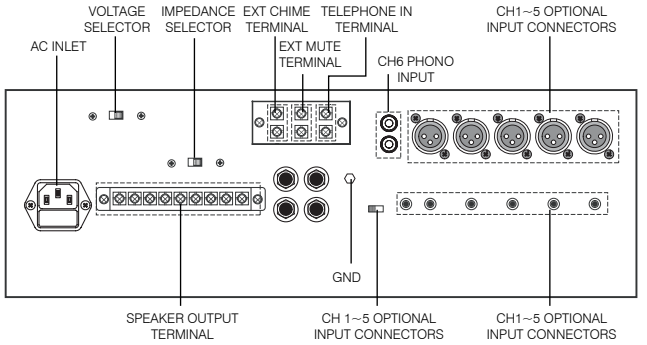
19" Rack Mount Bracket Options:



BKT-PA2000A

BKT-PA4000A/PA6000A





Specifications:

Model:	PA-2000A:	PA-4000A:	PA-6000A:
Output Power	60W RMS @ 100v/70v 60W RMS @ 8W/4W	120W RMS @ 100v/70v 120W RMS @ 8W/4W	240W RMS @ 100v/70v 240W RMS @ 8W/4W
Inputs	5 x Mic/line (3 pin XLR~F) 1 x Mix/Aux (stereo phono) 1 x Telephone (screw terminal)	5 x Mic/line (3 pin XLR~F) 1 x Mix/Aux (stereo phono) 1 x Telephone (screw terminal)	5 x Mic/line (3 pin XLR~F) 1 x Mix/Aux (stereo phono) 1 x Telephone (screw terminal)
Priority	Telephone, Mic 1, Mic 2	Telephone, Mic 1, Mic 2	Telephone, Mic 1, Mic 2
Input Sensitivity/Impedance	Inputs 1~6~1mV / 10kW Telephone~-2dB/600W	Inputs 1~6~1mV / 10kW Telephone~-2dB/600W	Inputs 1~6~1mV / 10kW Telephone~-2dB/600W
Frequency Response	60Hz~20KHz	60Hz~20KHz	60Hz~20KHz
Link in/out	**In:** 0dB/47kW **Out:** -6dB/600Ω	**In:** 0dB/47kΩ **Out:** -6dB/600Ω	**In:** 0dB/47kΩ **Out:** -6dB/600Ω
Power Requirement	230v AC 50Hz	230v AC 50Hz	230v AC 50Hz
Dimensions	420(W) x 100(H) x 320(D)mm	420(W) x 133(H) x 320(D)mm	420(W) x 133(H) x 320(D)mm
Weight	10kg	12kg	13.5kg

PA-1000B: 30W Mixer Amplifier

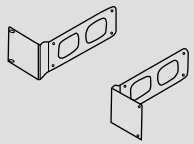
Simple, yet attractive mixer amplifier ideal for use in reception areas, waiting rooms, factories, education, AV and retail applications.

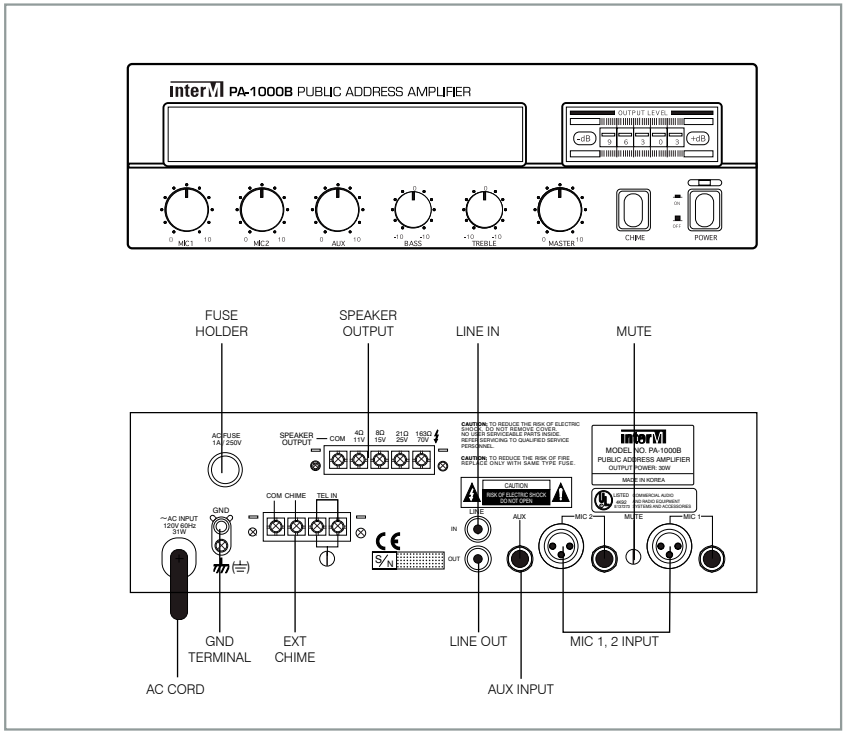
Full range frequency response makes the unit ideal for any voice or music system.

Features:

- Attractive design
- 2 Mic inputs (¼" jack~3 pin XLR)
- 1 AUX input (¼" jack)
- Line in ~ line out
- Priority inputs, telephone, mic 1
- Bass and treble control
- 100v/70v Loudspeaker output
- 8Ω/4Ω Low Z output option
- Remote chime option
- Optional 19" rack kit (BKT-PA1000B)
- 2U high

19" Rack Mount Bracket Option: BKT-PA1000B Bracket





Specifications:

Model:	PA-1000B:
Output Power	30W RMS @ 100v/70v 30W RMS 8Ω/4Ω
Inputs	1 x Mic (¼" jack and 3 pin XLR) 1 x Aux (¼" jack) 1 x Telephone (screw terminal)
Priority	Telephone, Mic 1
Input Sensitivity/Impedance	Mic 1, 2 = ¼" jack~ 1m v / 10kΩ Mic 1, 2 = 3 pin XLR~F Aux ~ 100m v/10kΩ Telephone ~ 0.775v / 600Ω
Frequency Response	60Hz~20KHz
Line In	1v / 10kΩ
Line Out	1v / 600Ω
Power Requirement	230v AC 50Hz
Dimensions	300(W) x 88(H) x 268(D)mm
Weight	4.6kg

A-60 / A-120: 60W, 120W Mixer Amplifiers

This simple economical desktop amplifier series provides a cost effective solution to basic PA and background music applications.

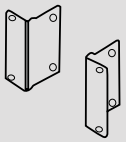
A-60/A-120 Amplifiers are extensively used throughout the UK's leading high street and supermarket retail outlets.

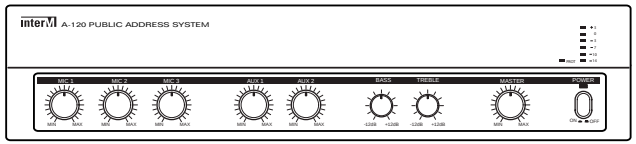
Features:

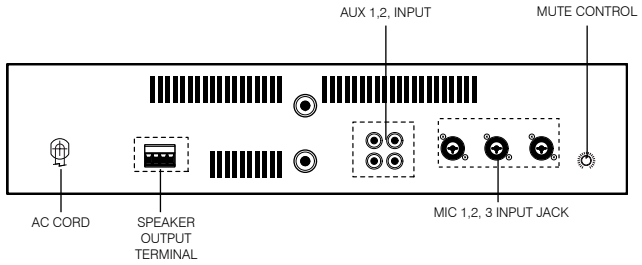
- Clean, functional design
- 3 Mic inputs (combi XLR / ¼" jack)
- 2 AUX inputs (stereo phono)
- Bass and treble control
- Priority input - mic 1
- Pheonix screw terminal for loudspeaker connection
- 2U high
- Optional 19" rack (BKT-A120*)

* Also fits A-60 Amplifiers

19" Rack Mount Bracket Option: BKT-A120 Bracket







Specifications:

Model:	A-60:	A-120:
Output Power	60W RMS @ 100v/70v 60W RMS @ 4Ω	120W RMS @ 100v/70v 120W RMS @ 4Ω
Inputs	3 x Mic (combi ¼" XLR) 2 x Aux (stereo phono)	3 x Mic (combi ¼" XLR) 2 x Aux (stereo phono)
Priority	Mic 1	Mic 1
Input Sensitivity/Impedance	Mic 1,2,3 ~ -60dB/600Ω Aux ~ -10dB/10kΩ unbalanced	Mic 1,2,3 ~ -60dB/600Ω Aux ~ -10dB/10kΩ unbalanced
Frequency Response	80Hz~16KHz	80Hz~16KHz
Power Requirement	230v AC 50Hz	230v AC 50Hz
Dimensions	420(W) x 88(H) x 320(D)mm	420(W) x 88(H) x 320(D)mm
Weight	8.9kg	10.3kg

PAM-120A: 120W Modular Mixer Amplifier

Top of the range mixer amplifier providing a versatile and flexible solution for many applications including AV, church and high end retail installations.

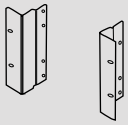
Optional music modules add to the outstanding features of this market leading product.

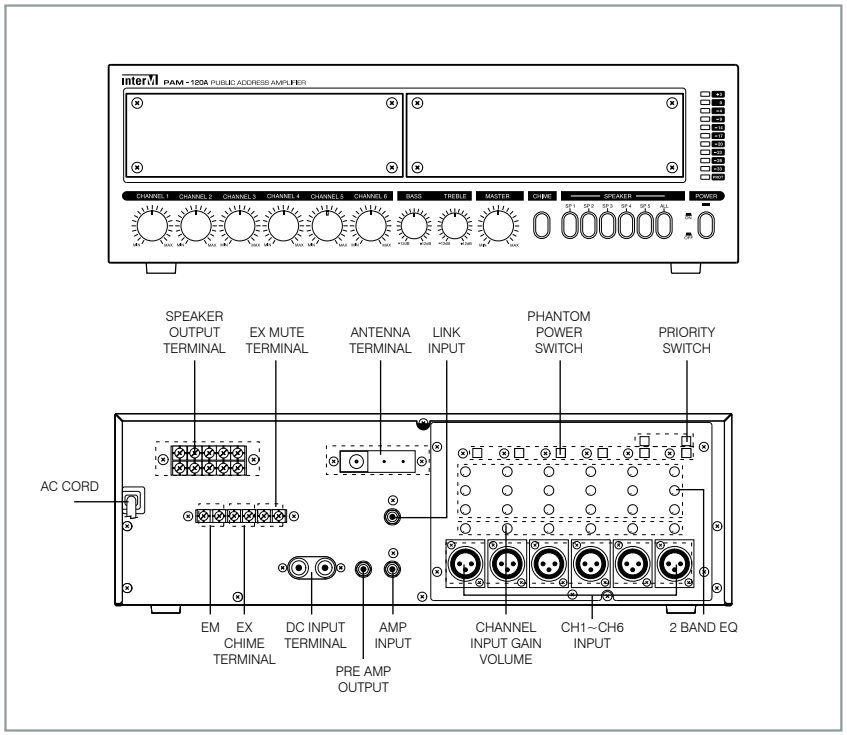
Features:

- 6 Mic/line inputs (3 Pin XLR)
- 2 Module option slots (see page 12 for tuner & CD modules)
- Link input (¼" jack)
- Amp in (¼" jack)
- Pre amp out (¼" jack)
- External chime (screw terminal)
- External mute (screw terminal)
- Individual EQ per input channel
- Individual phantom power (per mic input)
- Priority mic 1, mic 2 (switchable)
- 5 Zone loudspeaker selector
- Bar graph VU metre
- 230v AC/24v DC powered
- Optional 19" rack kit (BKT-PAM)
- 3U high
- Emergency message facility*

* Only available as custom factory install - contact the sales office on 0115 9770075 for details and prices.

19" Rack Mount Bracket Option: BKT-PAM Bracket





Specifications:

Model:	PAM-120A:
Output Power	120W RMS @ 100v/70v 120W RMS @ 4Ω
Inputs	6 x Mic/line (3 pin XLR)
Priority	Mic 1, Mic 2
Phantom Power	22v DC individually switched per input
Input Sensitivity/Impedance	1~6~ -60dB~16dB 1mv/10kΩ
Frequency Response	80Hz~20KHz
Link in	100mv/10kΩ
Amp in	1v/600Ω
Power Requirement	230v AC 50Hz 24vDC
Dimensions	420(W) x 132(H) x 360(D)mm
Weight	13kg

PAM-340A / PAM-480A: 340W, 480W Modular Mixer Amplifiers

Larger power/output versions of the PAM-120A, however with a number of subtle differences:-

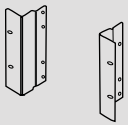
No 24v DC power option, no low impedance 4Ω loudspeaker option, but with the addition of a multi-zone paging mic interface allowing simple 5 zone paging using optional RM-05A. (See page 12 for details).

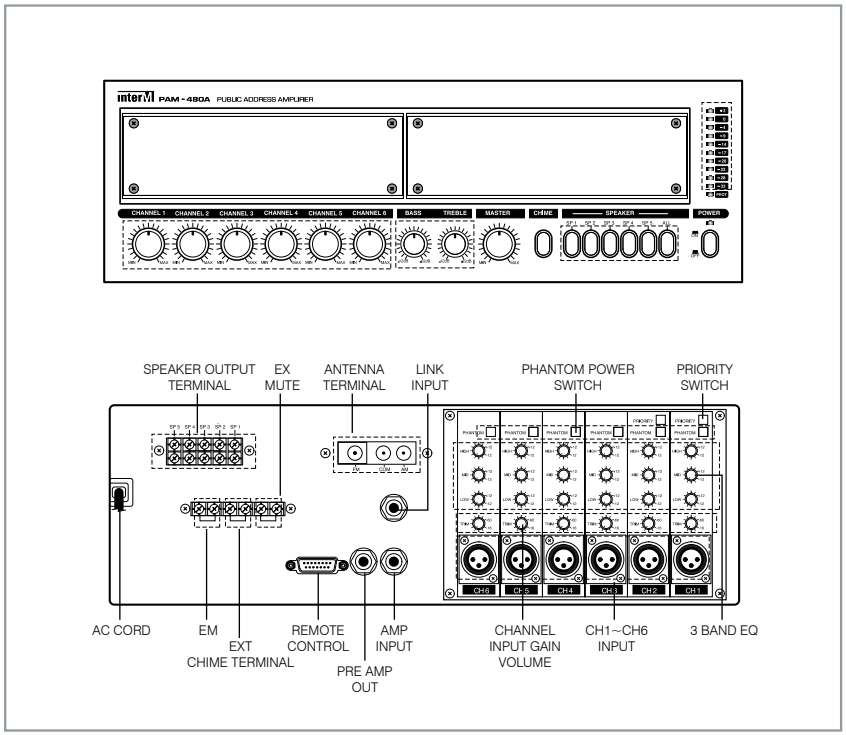
Features:

- 6 Mic/line inputs (3 pin XLR)
- 2 Module option slots (See page 12 for tuner and CD modules)
- Link input (¼" jack)
- Amp input (¼" jack)
- Pre amp out (¼" jack)
- External chime (screw terminal)
- Zone mic interface(15 pin D type)
- External mute (screw terminal)
- Individual EQ per input channel
- Individual phantom power (per mic input)
- Priority mic 1, mic 2 (switchable)
- 5 Zone loudspeaker selector
- Bar graph VU metre
- Optional 19" rack kit (BKT-PAM)
- 3U high
- Emergency message facility*

* Only available as custom factory install - contact the sales office on 0115 9770075 for details and prices.

19" Rack Mount Bracket Option: BKT-PAM Bracket





Specifications:

Model:	PAM-340A:	PAM-480A:
Output Power	340W RMS @ 100v	480W RMS @ 100v
Inputs	6 x Mic/line (3 pin XLR)	6 x Mic/line (3 pin XLR)
Priority	Mic 1, Mic 2	Mic 1, Mic 2
Phantom Power	22v DC individually switched per input channel	22v DC individually switched per input channel
Input Sensitivity/Impedance	Inputs 1~6 -60dB~ -16dB 1mv/10kΩ	Inputs 1~6 -60dB~ -16dB 1mv/10kΩ
Frequency Response	80Hz~20KHz	80Hz~20KHz
Power Requirement	230v AC 50Hz	230v AC 50Hz
Dimensions	420(W) x 132(H) x 360(D)mm	420(W) x 132(H) x 360(D)mm
Weight	13.5kg	15.5kg

PAM-CDA / PAM-T: PAM Series Music Modules

Easy to install and use modules for the PAM Series Amplifiers, comprising CD player with random play, scan, timer/counter, track skip facilities and an AM/FM Tuner with 30 pre-set station storage. Both use an internal input bus and will not take up any of the amplifier's mic/line inputs.

PAM-CDA: CD Player

Features:

- Single Compact Disc Player
- Random play funtion, music scan, time counter, repeat, forward track, reverse track, music search, play and pause

PAM-T: Tuner

Features:

- AM/FM Digital Tuner with 30 station memory
- It is recommended that an external antenna is fitted for optimum performance

RM-05A: Remote 5 Zone Microphone

The RM-05A will only operate with the larger PAM-340A/480A models and provides the facility of a simple 'one cable' multi-zone solution. The paging unit also includes output level LED VU metre, gain/level control and chime facility. Power is provided by the host amplifier.

Features:

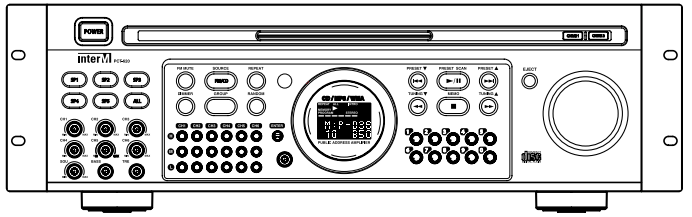
- Individual channel selection or all-call
- Flexible condenser-type gooseneck microphone
- Pre-announcement chime
- LED output level indicator

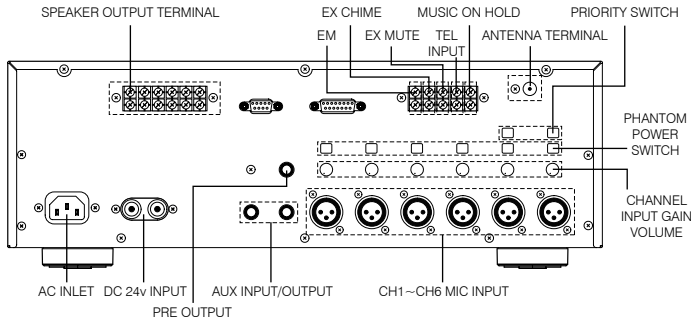
PCT-610 / PCT-620: Integrated Mixer Amplifiers

Fully integrated mixer amplifiers incorporating mic/line inputs with in-built Tuner and CD music sources. With a whole host of functions, the PCT Series is ideal for high specification PA systems, church and AV applications using the RS232 control option for remote access and control.

Features:

- 120W/240W Output
- 6 Inputs (Mic/Line XLR)
- Individual phantom power per input
- Priority mic 1, mic 2
- Telephone input (screw terminals)
- External mute (screw terminals)
- External chime (screw terminals)
- RM-05A Mic input (D-type)
- RS232 Control (D-type)
- 230v AC/24v DC powered
- Aux in/out (¼" jack)
- In-built CD and tuner music sources
- IR Remote control
- 3U high, 19" rack mounting





Specifications:

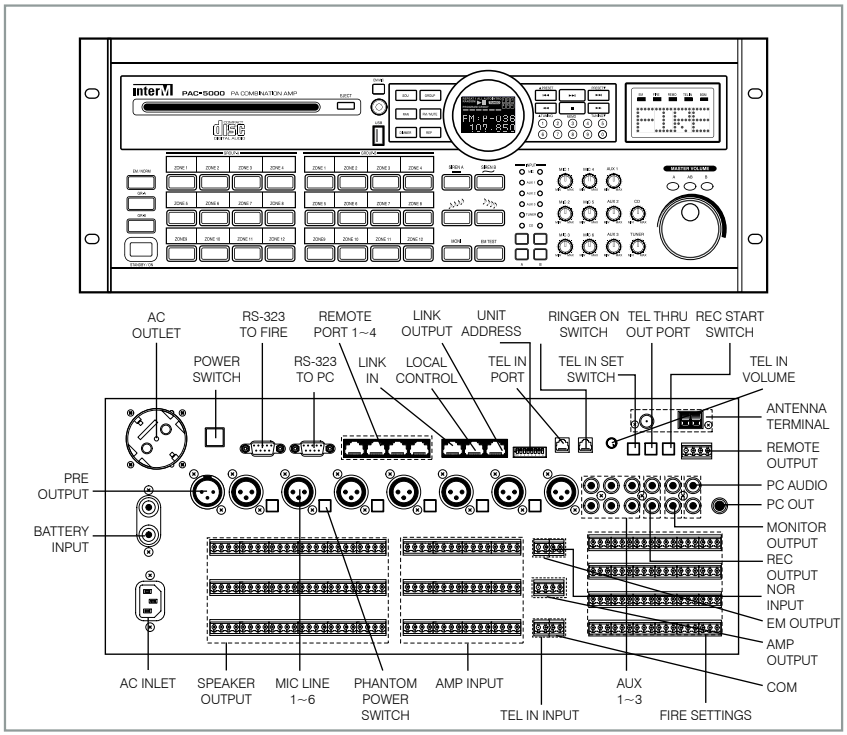
Model:	PCT-610:	PCT-620:
Output Power	120W RMS @ 100v	240W RMS @ 100v
Inputs	6 x Mic/Line Selectable (3 pin XLR)	6 x Mic/Line Selectable (3 pin XLR)
Priority	Mic 1, Mic 2, Chime, EM, Telephone Input	Mic 1, Mic 2, Chime, EM, Telephone Input
Phantom Power	Individually switched per input	Individually switched per input
Input Sensitivity/Impedance	Inputs 1~6~ -60dB~-16dB 1mv / 10k Ω	Inputs 1~6~ -60dB~-16dB 1mv / 10k Ω
Frequency Response	80Hz ~ 20KHz	80Hz ~ 20KHz
Link In	100mv / 10kΩ	100mv / 10kΩ
Amp In	1v / 47kΩ	1v / 47kΩ
Pre Amp Out	1v / 600Ω	1v / 600Ω
Power Requirement	230v AC 50Hz / 24v DC	230v AC 50Hz / 24v DC
Dimensions	482(W) x 132(H) x 380(D)mm	482(W) x 132(H) x 380(D)mm
Weight	8.5kg	9.5kg

PAC-5000: Multi-zone Combination Amplifier

Fully digital multi-zone amplifier system offering up to 24 separate zone switching/selection and BGM facilities. The PAC-5000 can be used for secondary evacuation systems in shopping centres, halls, office blocks and apartment complex installations. PAC-5000 is both mains and DC powered.

Features:

- 24 Outputs (2 x groups of 12)
- 6 Mic inputs
- 3 Aux inputs
- Internal tuner and CD mechanism
- Inbuilt monitor loudspeaker
- Internal microphone (for emergency broadcast from the unit)
- Telephone input
- Record input
- Pre amp output
- Record input (for internal emergency message facility)
- RS232C PC interface
- Fire alarm interface
- RJ45 Remote control ports
- Mains 230v AC powered
- 24v DC Power option



Specifications:

Model:	PAC-5000:
Output Power	240W (2 x 120W)
Inputs	6 x Mic (3 pin XLR) / 3 x Aux (Stereo phono)
Outputs	24 x 100v line Speaker Outputs
Phantom Power	Individually switched per input
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 177 (H) x 369(D)mm
Weight	15.2kg

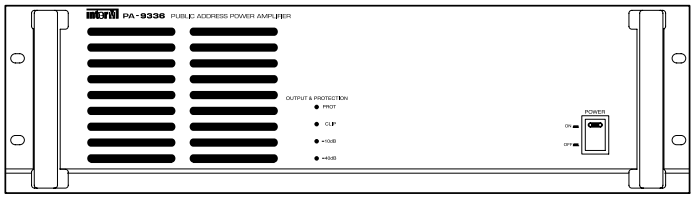
PA-9312 / PA-9336 / PA9348: Power Amplifiers

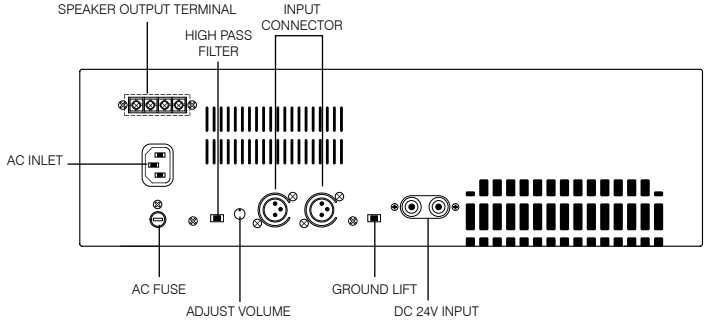
For installations which require pure power, the Inter-M PA-9000 Series of power amplifiers are reliable, robust work horses. Units can be mains or DC powered so can easily operate in a critical system or in event/hire applications using battery power. Connections and controls are rear panel mounted to deter tampering or accidental adjustment.

Features:

- 120W/360W/480W Output power (100v/70v and 80Ω and 4Ω*)
- Audio/line in - (3 pin XLR)
- Audio/line out - (3 pin XLR)
- Input level control (on rear)
- Ground lift and HPF switches
- Fan cooled
- Thermal protection circuit
- DC power terminals
- 3U high, 19" rack mounting

* PA-9312 only has 4Ω low Z output. PA-9336 / PA-9348 have 4Ω and 8Ω options.





Specifications:

Model:	PA-9312:	PA-9336:	PA-9348:
Output Power	120W RMS @ 100v / 70v and 4Ω	360W RMS @ 100v / 70v and 8/4Ω	480W RMS @ 100v / 70v and 8/4Ω
Input Sensitivity/Impedance	1v/ 10kΩ	1v / 10kΩ	1v / 10kΩ
Output Sensitivity/Impedance	1v / 10kΩ	1v / 10kΩ	1v / 10kΩ
Frequency Response	70Hz ~ 18KHz	70Hz ~ 18KHz	70Hz ~ 18KHz
Power Requirement	230v AC 50Hz / 24V DC	230v AC 50Hz / 24V DC	230v AC 50Hz / 24V DC
Dimensions	482(W) x 132(H) x 280(D)mm	482(W) x 132(H) x 280(D)mm	482(W) x 132(H) x 280(D)mm
Weight	14kg	21kg	22kg

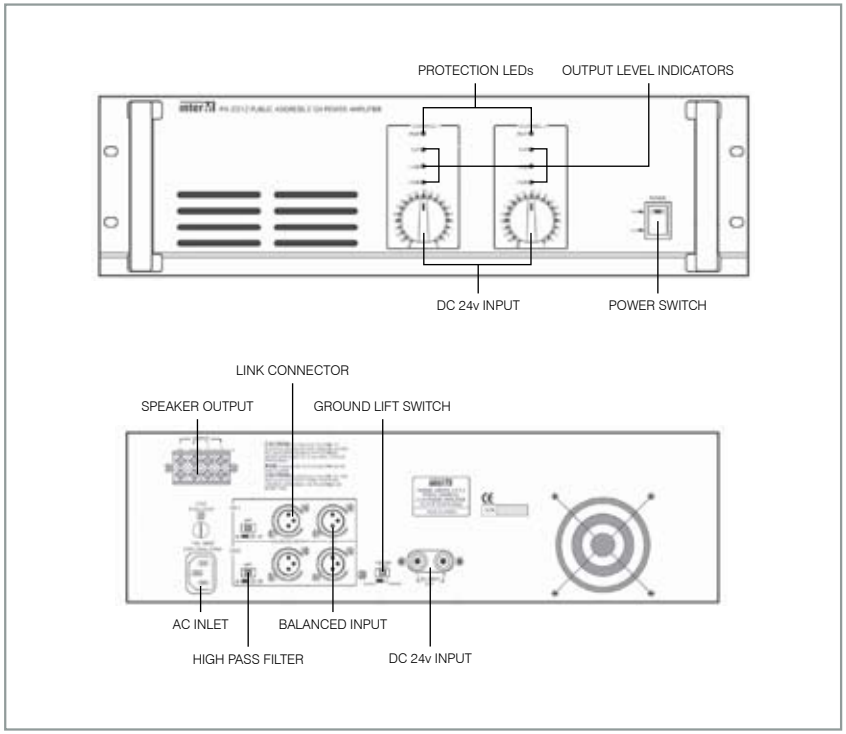
PA-2312: Dual Channel Power Amplifier

A reliable dual-channel 100v line power amplifier for PA systems requiring 2 zones, or for space-saving integration into multi-zone rack builds.

The PA-9312 can be mains or DC powered and will also operate, therefore, in critical system or portable event/hire applications using battery power.

Features:

- 2 x Independent 120W output power
- 2 x XLR Balanced inputs
- 2 x Link outputs
- Thermal protection circuit
- High pass filter
- Fan cooled
- Ground lift switch
- 230v AC/24v DC powered
- 3U high, 19" rack mounting



Specifications:

Model:	**PA-2312:**
Output power (THD 1%)	12W (23v/4Ω, 70v/14Ω, 100v/28Ω)
Frequency response (+1/-3dB)	70Hz ~ 18KHz
THD at 1KHz Rated Output	Less than 1%
HPF	6dB/Oct at 400Hz
Signal to Noise Ratio	Better than 95dB
Input Sensitivity/Impedance	1v/10kΩ Balanced
Power Source	230v AC 50Hz / 24v DC
Dimensions	482(W) x 132(H) x 280(D)mm
Weight	20kg

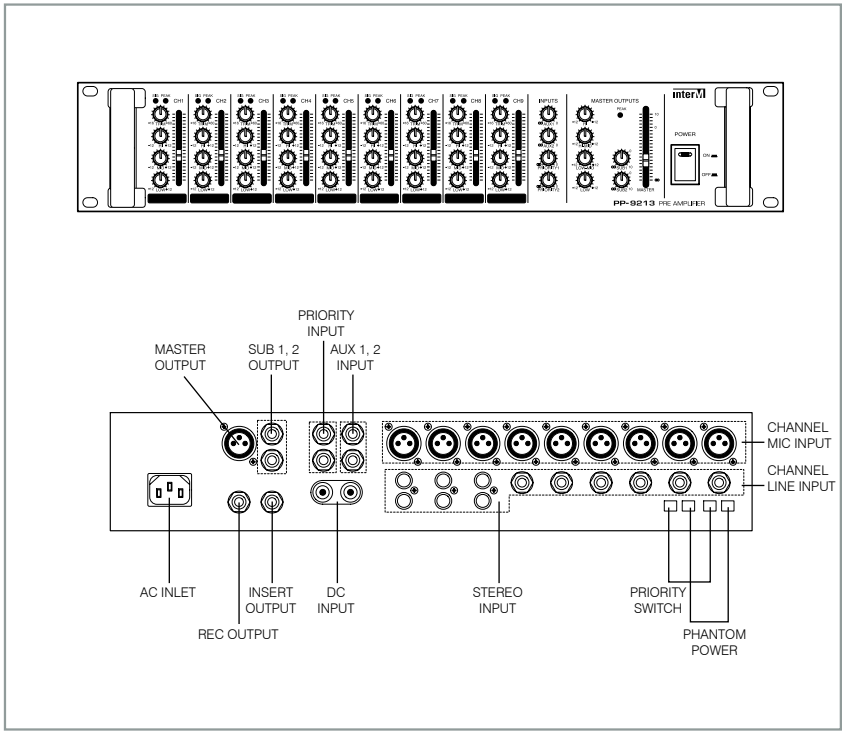
PP-9213: Mixer Pre-Amplifier

Comprehensive mixer pre-amplifier unit providing 12 inputs and 3 outputs.

Ideal for multi-input applications such as church, conference, audio visual and high spec PA systems where maximum system control is required.

Features:

- 9 x Mic inputs(XLR)
- 6 x Line mono (¼" jack)
- 3 x Line stereo (2 x ¼" jack)
- Line out (XLR~M)
- Sub 1, 2 out (¼" jack)
- Record out (¼" jack)
- Phantom power, inputs 1 & 2 (18v)
- Trim control per input
- EQ control per input
- Input/output level via fader
- EQ control of output
- 24v DC Terminal (binding post)
- 2U high, 19" rack mounting



Specifications:

Model:	PP-9213:
Inputs	9 Mic (XLR) 6 Mono Line (¼ " Jack) 3 Stereo Line (2 x ¼" Jack)
Input Sensitivity/Impedance	Mic -60dB / 600Ω Line -30dB / 10kΩ
Output Sensitivity/Impedance Master	+4dBm / 600Ω Balanced
Sub Outs	+4dBm / 600Ω Balanced
Rec Out	-10dB / 10kΩ
Phantom Power	Mic 1, 2 ~ 18v DC
Frequency Response	20Hz ~ 20KHz
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	5kg

Vauxhall Reg Vardy

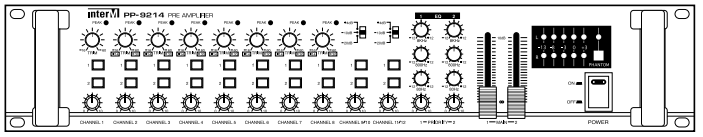
Leading car dealership Reg Vardy's newly - built Vauxhall showroom features high quality background music and zoned paging for showrooms, forecourt, service and office areas all powered and controlled using Inter-M's PAM-240 Mixer Amplifiers.

PP-9214: Mixer Pre-Amplifier

Two output pre-amplifier allowing any of the 10 input signals to be routed to either Output 1, Output 2 or both. Ideal for dual zone applications in factories, leisure centres, hotels and general PA installations.

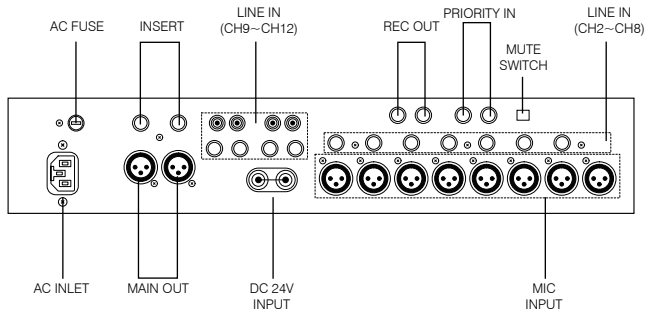
Features:

- 8 Mic inputs (XLR)
- 8 Line inputs (¼" jack)
- 2 Stereo inputs (phono/¼" jack)
- 2 Outputs (XLR)
- Phantom power (18v block switched)
- Record output (2 x ¼" jack)
- Priority, mic 1, priority input 1, priority input 2
- 3 Band EQ per output
- Signal allocation per input channel
- 24v DC powered option
- 2U high, 19" rack mounting



Specifications:

Model:	PP-9214:
Inputs	8 Mic (XLR) 8 Mono Line (¼" Jack) 2 Stereo Line (2 x ¼" Jack / 2 x Stereo Phono)
Input Sensitivity/Impedance	**Mic** -60dB / 600Ω Balanced **Line** -30dB / 10kΩ Balanced
Stereo	+4dB, -10dB, -20dB / 10kΩ Unbalanced
Output Sensitivity/Impedance Master	+4dBm / 600Ω Balanced
Rec Out	-6dB / 10kΩ
Phantom Power	Mic 1~8 18v DC Block Switched
Frequency Response	20Hz ~ 20KHz
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	12.8kg

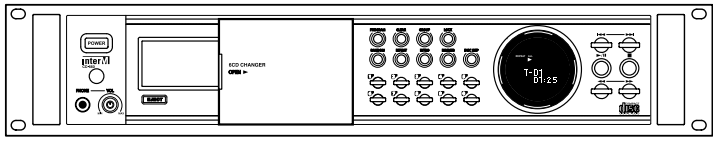


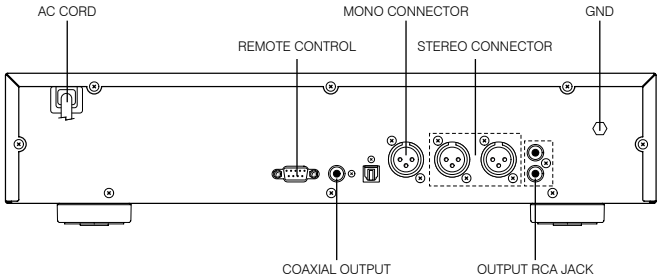
CD-660: Multi-Disc CD Player

6 Disc CD player ideal for providing background music for most installations. The CD-660 also incorporates RS-232C serial interface, allowing control of the unit's functions via AMX/Crestron or similar control software; a must-have requirement for today's audio visual sector.

Features:

- 6 Disc CD magazine
- Clear, dot-matrix display
- Mono and stereo out (XLR/stereo phono)
- Headphone output
- Random/repeat functions
- Optical/digital output
- 2U high, 19" rack mounting
- 230v AC and 24v DC power





Specifications:

Model:	CD-660:
CD Mechanism	6 Disc magazine type
Compatability	CD, CD-R, CD-RW, MP-3 and WMF
Output Level	Mono XLR ~ 4v +9dB/-30db Variable Stereo Phono / 2 x XLR ~ 2v +9dB/-30db Variable
Headphone Out	1.5v Max
RS232C	Serial port 9 pin D type
Digital/Optical Out	SPDIF (IEC958)
Frequency Response	20Hz ~ 20KHz
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 88(H) x 880(D)mm
Weight	6.2kg

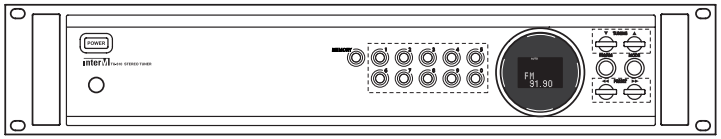
TU-610: Stereo AM/FM Tuner

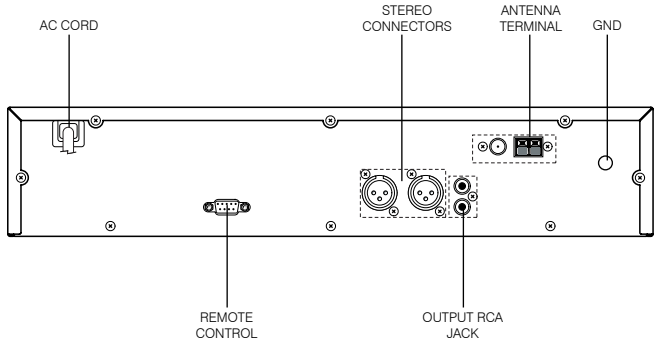
AM/FM Tuner for 19" rack system installation in environments which require the broadcast of radio stations.

Up to 40 pre-set stations can be stored or recalled. Units can be integrated into AMX/Crestron controlled systems making them ideal for AV applications.

Features:

- AM/FM Bands
- 40 Pre-set stations
- Stereo output (2 x XLR/stereo phonos)
- RS232 control (9 pin D-type)
- Infrared remote control
- Mains powered
- 2U high, 19" rack mounting





Specifications:

Model:	TU-610:
AM Range FM Range	522~1629 KHz 87.5~108.0 MHz
Output Level	Stereo Phono / 2 x XLR ~ AM -10dB, FM 0dB
RS232C	Serial Port 9 pin D Type
Power Requirement	230v AC 50Hz
Dimensions	482(W) x 88(H) x 380(D)mm
Weight	5.2kg

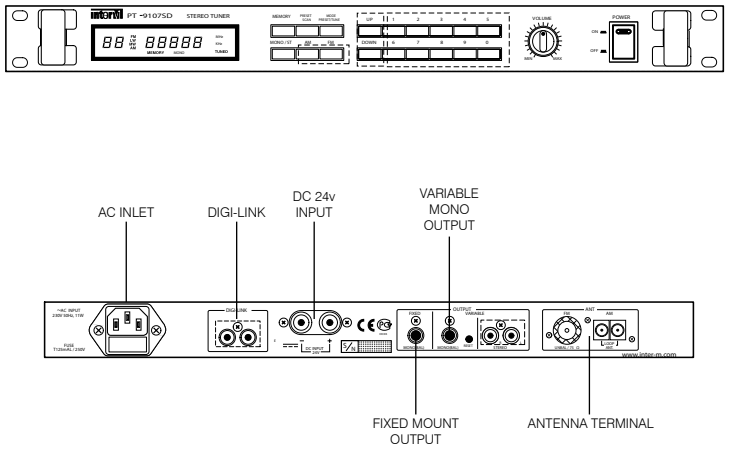
PT-9107SD: AM/FM Tuner

Slimline 19” rack mounting tuner operating on AM and FM bands. 20 pre-set stations make the unit ideal for many commercial installations requiring radio broadcast.

Fixed/variable and stereo/mono output options are also available.

Features:

- AM/FM bands
- 20 Pre-set stations
- Mono output /fixed (¼” jack)
- Mono output/variable (¼” jack)
- Stereo output/variable (stereo phonos)
- 230v AC/24v DC powered
- 1U high, 19” rack mounting



Specifications:

Model:	PT-9107SD:
AM Range	522~1611 KHz
FM Range	87.5~108.0 MHz
Pre Set Stations	20
Output Levels	FM Stereo ~ 500mV Balanced FM Mono ~ 1v Balanced AM Mono ~ 240 mV Balanced
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 44(H) x 280(D)mm
Weight	3.5kg

DHL Air Cargo Hub

Based at East Midlands Airport and covering both land-based and airside operations, this key distribution hub features an Inter-M integrated system as the backbone to its site-wide PA and VA.

Integrated into the building management system of the site, the CIE-Group designed and built racks provide zoned paging and messaging functions as well as a structured evacuation system for use in emergency situations.

PC-9335AD: Twin Auto-Reverse Cassette Deck

Comprehensive cassette unit capable of both playback and recording of music and voice to tape.

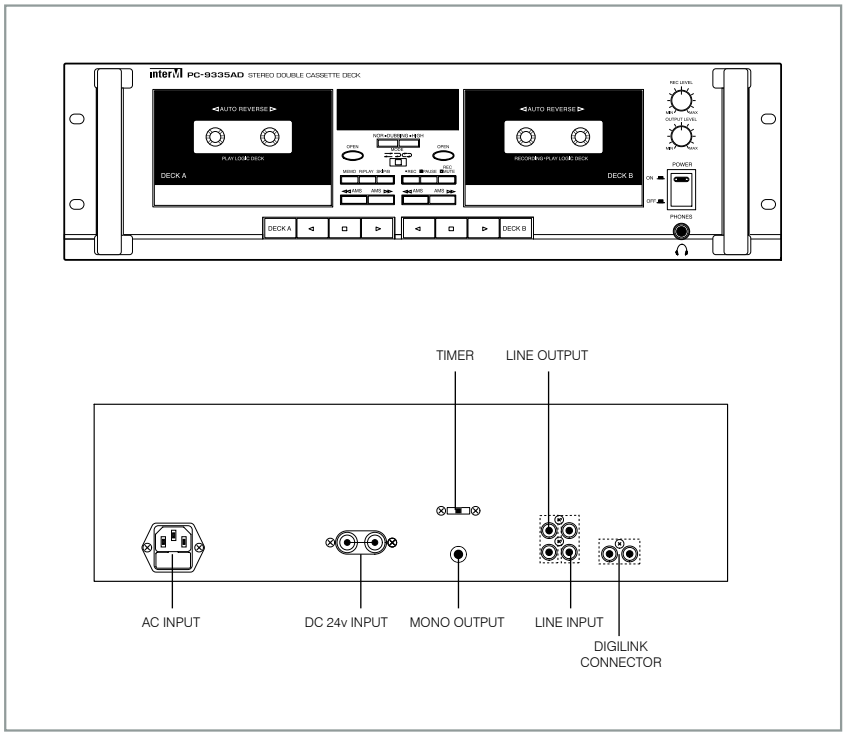
Normal and high speed duplication/dubbing is possible as well as standard play, fast forward, rewind, stop/pause features.

The unit can also be powered by 24v DC which is ideal for hire and portable event applications.

A multi-position timer function will also allow the unit to auto-function when the mains is switched on. PLAY - Auto play when powered. RECORD - Auto record when powered (deck B only).

Features:

- Twin decks
- Normal/high speed dubbing
- Variable record level
- Auto-reverse option
- Fixed mono output (¼" jack)
- Stereo output (variable)
- Stereo line input (phonos)
- Stereo line output (phonos)
- 230v AC/24v DC Option
- 3U high, 19" rack mounting



Specifications:

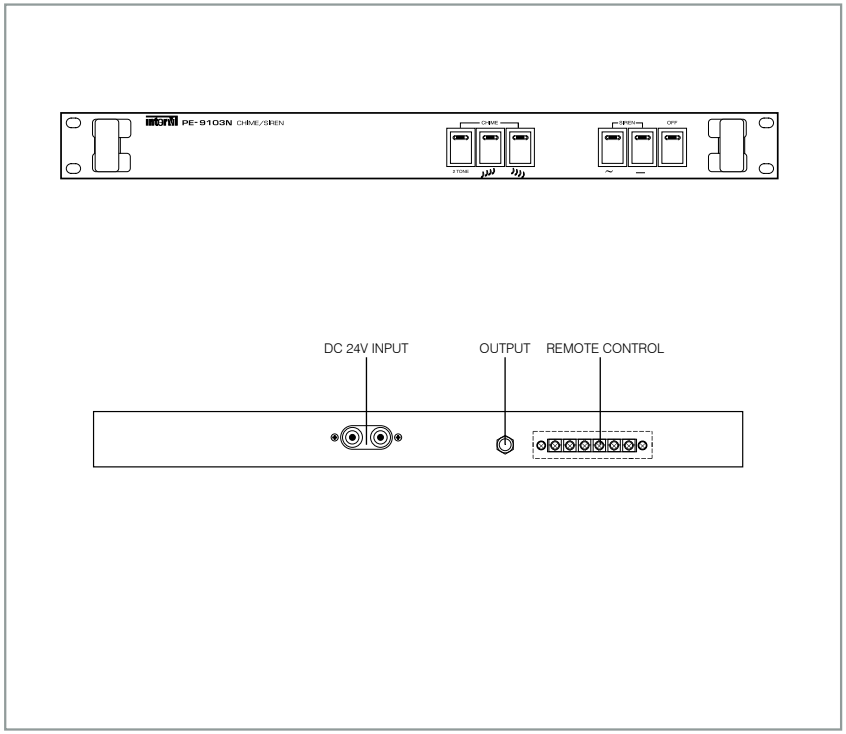
Model:	PC-9335AD:
Deck A Deck B	Playback Playback and Record
Frequency Response	125 Hz ~ 6.3kHz
Output Level/Impedance	600mV ~ 600Ω
Record Input	160mV ~ 10kΩ
Power Requirement	230v AC 50Hz / 24v DC
Dimensions	482(W) x 132(H) x 280(D)mm
Weight	5.8kg

PE-9103N: Chime/Siren Generator

Tone Generator allowing the selection of 4 chime/tone options or 2 siren options. It can be used as part of a larger system or can be used as a stand-alone generator.

Features:

- Chime/tone options: Rising 4 note, falling 4 note, 2 note
- Siren options: Continuous, oscillating
- Activation on front panel
- Rear panel remote access for chime options (screw terminals)
- Line level output (¼" jack)
- 24v DC powered
- 1U high, 19" rack mounting



Specifications:

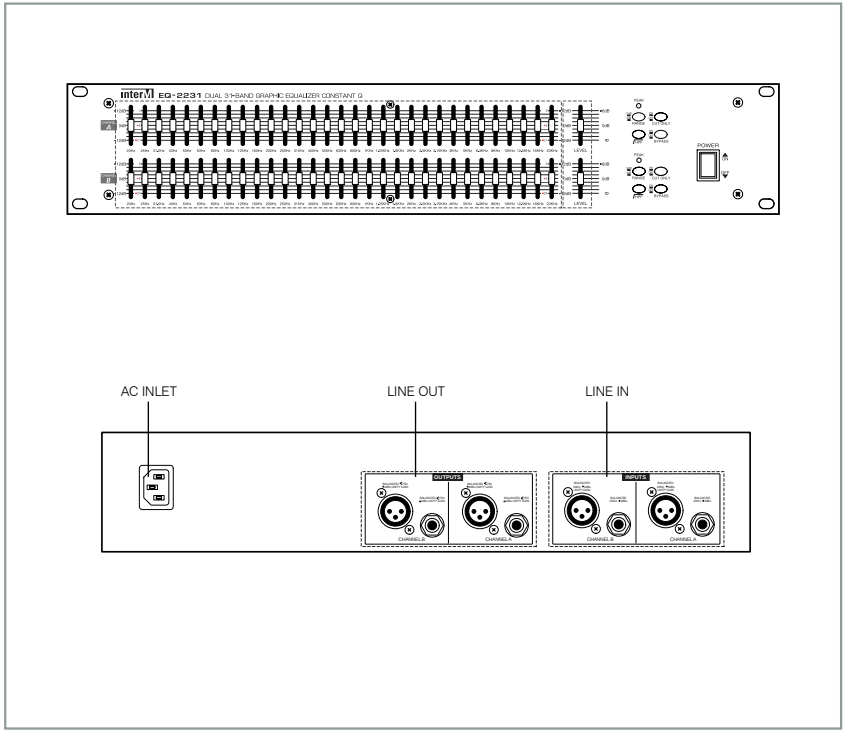
Model:	PE-9103N:
Chime Options	4 note assending, 4 note decsending and 2 tone (ding dong)
Siren Options	Continuous and oscillating
Remote Control (Chime only)	Screw terminal on rear panel
Output Level/Impedance	1V / 10kΩ Unbalanced
Power Requirement	24v DC
Dimensions	482(W) x 44(H) x 280(D)mm
Weight	2.8kg

EQ-2131 / EQ-2231: 31 Band Graphic Equalisers

31 Band graphic equaliser (EQ-2131) and 31 band stereo EQ (EQ-2231) ideal for installations where detailed control of the sound is required, e.g. church, conference room or acoustically difficult environments. Stereo operation, bypass and HPF are standard.

Features:

- 31 Band control (sliders/faders)
- Input gain/level (sliders/faders)
- Bypass switch (per channel)
- HPF Switch (per channel)
- Inputs (XLR~¼" jack)
- Outputs (XLR~¼" jack)
- Mains powered
- 2U high, 19" rack mounting



Specifications:

Model:	EQ-2131/EQ-2231:
EQ2131 EQ2231	1 x 31 Band 2 x 31 Band
EQ Frequency	1/3 Octave
Input Level/Impedance	0dB/600Ω Balanced
Output Level/Impedance	0dB/600Ω Balanced
High Pass Filter/HPF	80Hz
Frequency Response	20Hz ~ 20kHz
Power Requirement	230v AC 50Hz
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	4.5kg

Powered by Inter-M

Barclaycard Headquarters

The massive Barclaycard Headquarters complex features a highly complex PA and messaging system using Inter-M powered rack systems designed and built for the installer by CIE-Group's in-house engineering department.

Comprising a total of 11 PA9336 Power Amplifiers and 9 EQ9152 Graphic Equalisers, the two 39U racks provide a total nearly 4000W over 6 zoned areas.

Southampton Cardiothoracic Centre

Southampton University Hospital's Cardiothoracic Centre features a fully-integrated AV system to provide live TV broadcast of cardiological procedures for training purposes, both from room-to-room and also worldwide via videoconferencing.

Together with high resolution, AMX-controlled multiple screens in the main lecture theatre, the system also features two-way audio broadcast, powered by the Inter-M R300+ stereo amplifier, for communication between operating and lecture theatres.

Nottingham Magistrates Court

The PA and evacuation system at the impressive Nottingham Magistrates Court has been designed around a complex Inter-M audio rack system, built and delivered directly to site by CIE-Group.

Consisting of Inter-M power amplifiers, mixers and battery back-up products, the system provides a flexible paging and voice evacuation solution.

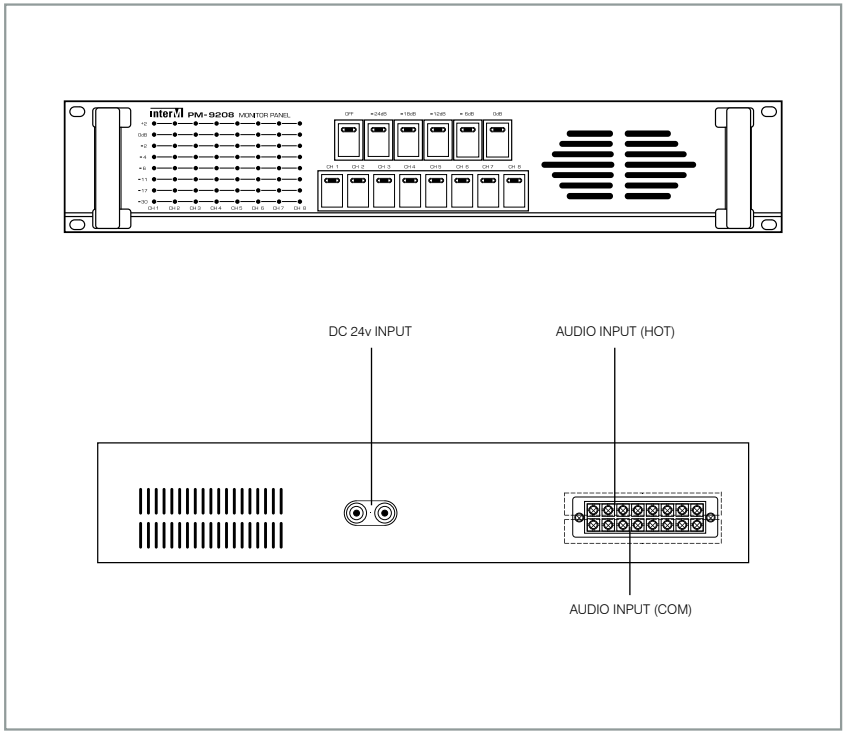
PM-9208: 100v Line Monitor Panel

Ideal for large commercial installations, the PM-9208 allows 8 separate 100v signals (speaker lines/ amplifier outputs) to be monitored, using simple push switch selection and internal loudspeaker to select and listen to the required signal.

Visual indication of output is also provided via 10 segment LED meter.

Features:

- 8 Zone selection
- Monitor loudspeaker (1.5W)
- 10 Segment LED output meter
- 100v input/output (screw terminal)
- 24v DC powered
- 2U high, 19" rack mounting



Specifications:

Model:	PM-9208:
Zones/Channels	8 x @ 100v Line
100v In / Out	Screw terminal on rear panel
Loudspeaker Power	1.5W
Visual Display	10 Segment LED
Power Requirement	24v DC
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	3.8kg

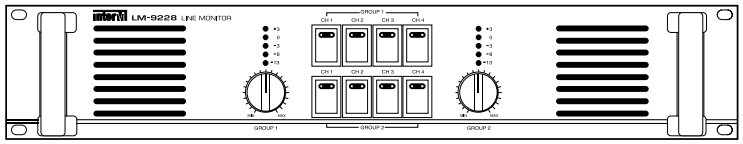
LM-9228: Line Level Monitor Panel

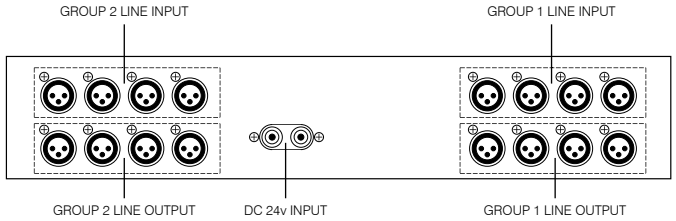
Similar in operation to the PM-9208, the LM-9228 will monitor up to 8 separate line level audio signals. Split into 2 groups of 4, each group has an individual line selector with visual LED indicator and volume control for the internal loudspeaker.

Inputs and outputs are XLR and the LM-9228 is simply inserted into any line level signal path.

Features:

- Group 1/4 individual channels
- Group 2/4 individual channels
- 2 x internal loudspeakers with volume control
- Inputs (XLR)
- Outputs (XLR)
- 24v DC powered
- 2U high, 19" rack mounting





Specifications:

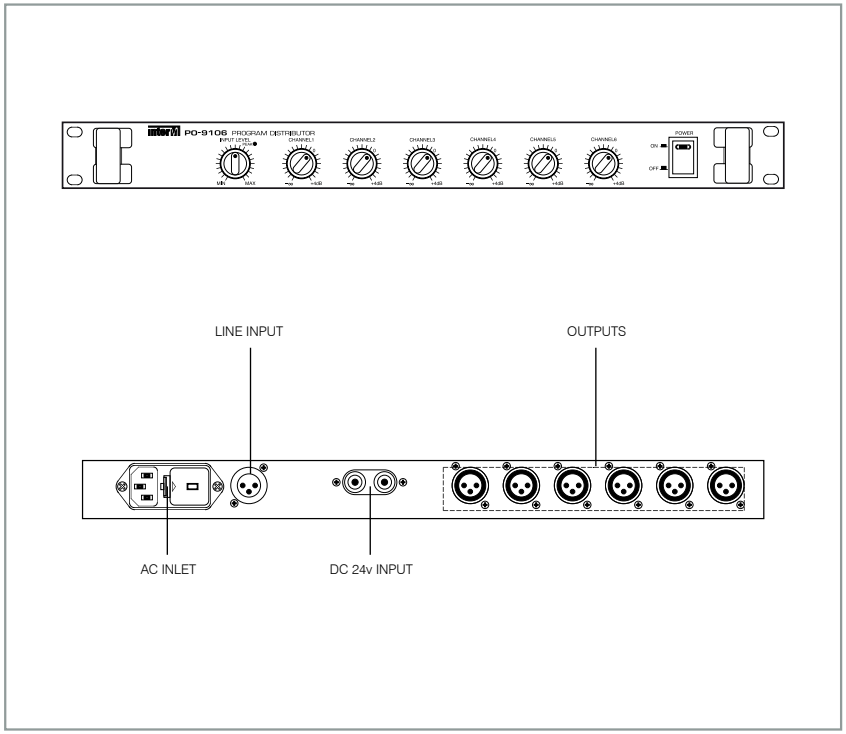
Model:	LM-9228:
Zones/Channels	8 x @ Line Level (2 x Groups of 4)
Line In / Out (per channel)	XLR
Loudspeaker Power	1.5W
Channel Activation	Latching Switch with in-built LED
Power Requirement	24v DC
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	7.5kg

PO-9106: Program Distributor

Allows the distribution of a line level signal to six separate outputs, ensuring no loss of signal when using multiple amplifiers in larger industrial systems or for distribution of the level signals over long distances and/or to multiple destinations.

Features:

- 1 Input (XLR)
- 6 Outputs (XLR)
- LED output signal LEDs
- Independant level controls of input/output
- 230v AC/24v DC powered
- 1U high, 19" rack mounting



Specifications:

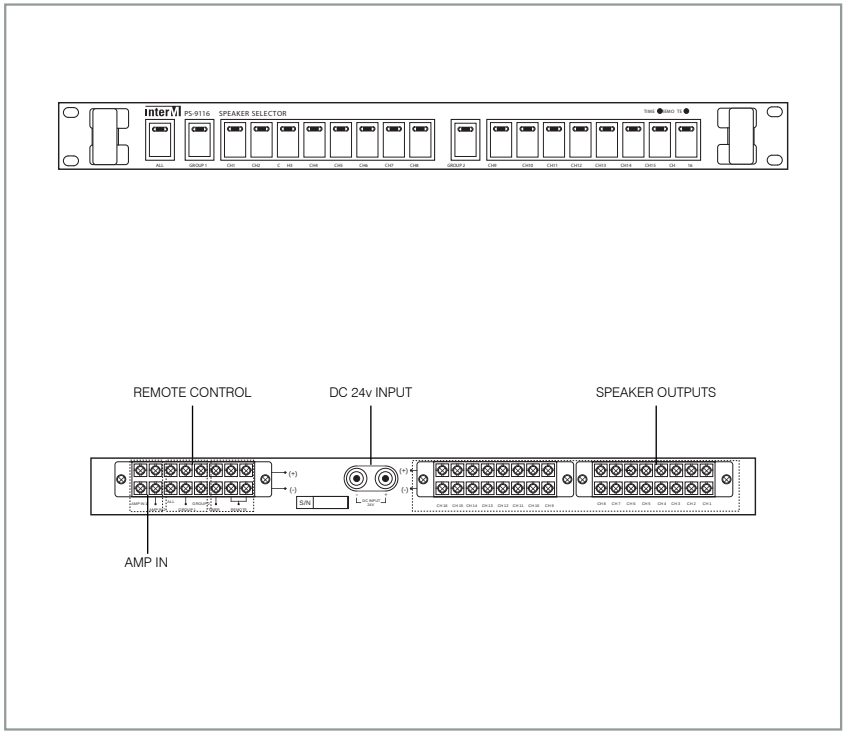
Model:	PO-9106:
Input	1 Variable Level ~ XLR
Outputs	6 x Variable Level ~ XLR
Input Level/Impedance	1v / 600Ω Balanced
Output Level/Impedance	1v / 600Ω Balanced
Frequency Response	20Hz ~ 20kHz
Power Requirement	230v AC ~ 24V DC
Dimensions	482(W) x 44(H) x 280(D)mm
Weight	4kg

PS-9116: 100V Line Loudspeaker Selector

The PS-9116 allows the selection of up to 16 individual loudspeakers/zones fed by a 100v amplifier or 2 groups of 8 loudspeakers fed by 2 separate amplifiers. Loudspeakers/zones are selected using switches with in-built LED indicators or groups can be activated via voltage-free contacts on the rear.

Features:

- 16 Individual zones
- LED indicator of selected zone
- Remote control of 2 x 8 groups via voltage-free contact
- 24v DC powered
- 1U high, 19" rack mounting



Specifications:

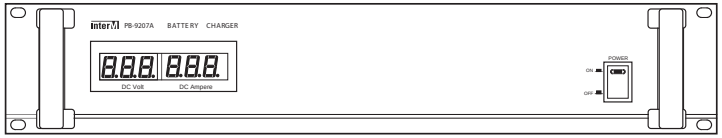
Model:	PS-9116:
Loudspeakers/Zones	16 Individual 2 x Groups of 8
Remote Control (All or 2 x Groups of 8)	Voltage-free contact ~ screw terminal on rear
Power Requirement	24v DC
Dimensions	482(W) x 44(H) x 280(D)mm
Weight	4kg

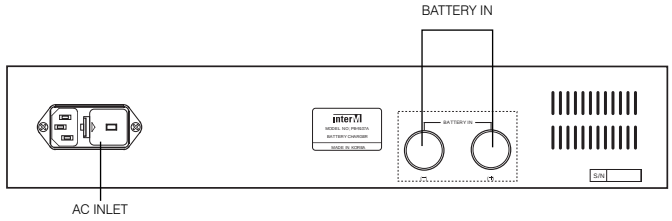
PB-9207A: Battery Charger

For use with all Inter-M power amplifiers, the PB-9207 allows the use of DC batteries for systems which require back-up in the event of mains failure. By continuous monitoring of the batteries, the PB-9207 will automatically charge, thus keeping the batteries in good condition until needed. Status and condition of the batteries is shown on a clear LED display on the front panel.

Features:

- 1 Large LED status/display shows volts and amps
- DC input terminals (on rear)
- Mains powered
- 2U high, 19" rack mounting





Specifications:

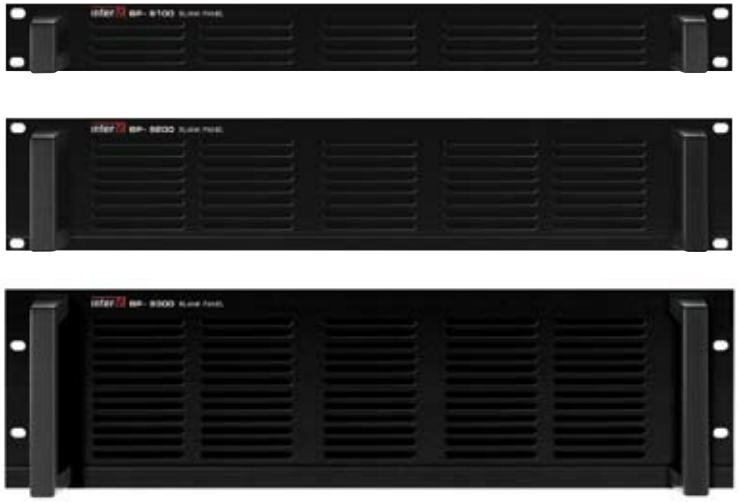
Model:	PB-9207A:
Charging Current	3A
Charging Voltage	27.3v DC
Display	LED, volts and amps
Protection	Overcurrent and overcharge
Power Requirement	230v AC 50Hz
Dimensions	482(W) x 88(H) x 280(D)mm
Weight	6.2kg

BP-9100 / BP-9200 / BP-9300: 19" Vent Panels

Matching the look of the 19" rack mount products from Inter-M, the vent panels not only give a professional finish to an assembled rack system, but also allow appropriate air flow through the system, thereby keeping it cool and running efficiently.

Features:

- 19" Rack mounting
  - BP-9100 (1U high)
  - BP-9200 (2U high)
  - BP-9300 (3U high)



GS-50BT/WT: Fashion Speakers

Their modern, compact design makes the GS-50 Series ideal for installations in retail, leisure and AV applications.

Both black and white versions incorporate 5" woofer and 2¼" tweeter, giving a full range reproduction of music and voice. Units run in 100V line as well as low impedance 4Ω.

Features:

- Modern, compact design
- Option of black (BT) or white (WT)
- 100v Operation
- 4Ω Option
- Push fit cable connection

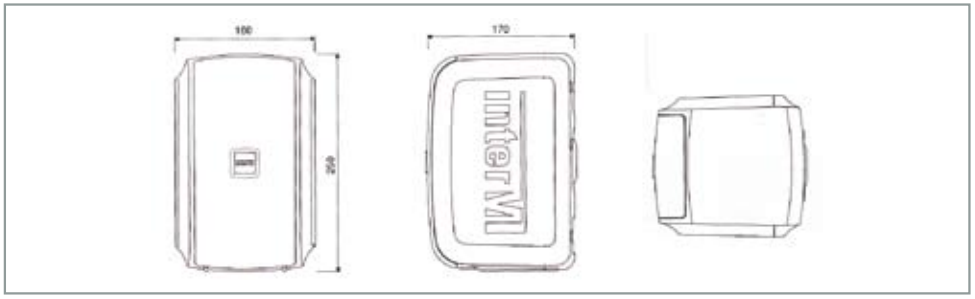
Bracket Options: (not supplied as standard)

- FSB-1W (White)
- FSB-1B (Black)

Specifications:

Model:	GS-50BT/WT:
Power	20W @ 100v Line 20W @ 4Ω Low Impedance
Connection	Spring-loaded push terminals on rear
Frequency Response	150Hz ~ 15KHz
SPL @1W/1m	90dB
Colour Options (specify)	Black ~ BT White ~ WT
Dimensions	160(W) x 250(H) x 170(D)mm
Weight	3.1kg

Dimensions:



IWS-10AB/AW Series: 10W Designer Wall Speakers

The slimline, modern apperarance of the IWS Series makes it an ideal loudspeaker for use in offices, waiting rooms, retail sites, etc. Available in black or white, the units also come with a multi-step volume control fitted to the side, allowing easy volume adjustment.

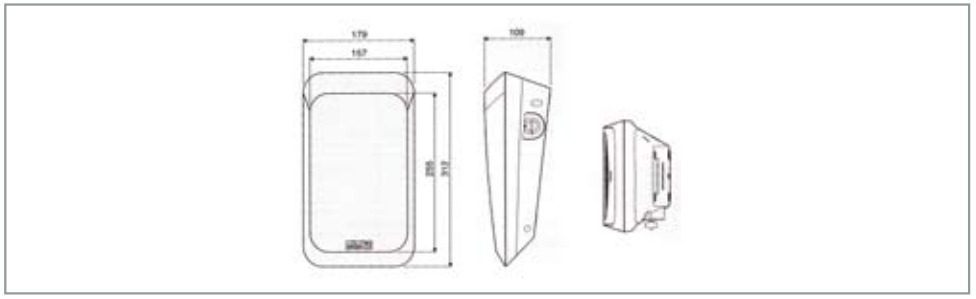
Features:

- Slimline
- Modern design
- Option of black (AB) or white (AW)
- Mulit step volume control

Specifications:

Model:	IWS-10AB/AW:
Power	10W @ 100v line
Connection	Spring-loaded push terminals on rear
Attenuator/Volume Control	Off, -12dB, -6dB and 0dB
Frequency Response	220Hz ~ 12KHz
SPL @1w/1m	90dB
Colour Options/Suffix	Black ~ AB White ~ AW
Dimensions	179(W) x 312(H) x 109(D)mm
Weight	1.3kg

Dimensions:



CS-720 / CS-730 / CS-740: Indoor Column Loudspeaker

These indoor column speakers are ideal for installation in church, chapel, conference and hall environments where quality speech clarity is required. Manufactured from alloy extrusion, the units are supplied with a multi-position mounting bracket and have a cloth grille on the front.

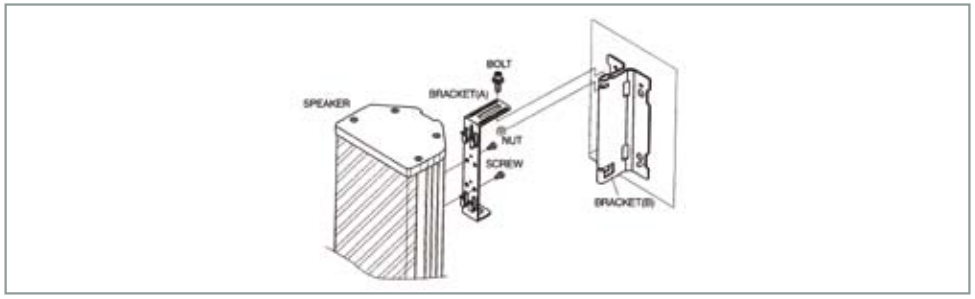
Features:

- Neutral/off-white colour
- Slimline appearance
- Multi-position mounting bracket
- 100v Power taps (rated and ½ power)
- Screw terminal connection

Specifications:

Model:		CS-720/730/740:
Power/Taps	CS-720:	20/10W @ 100v line
	CS-730:	30/15W @ 100v line
	CS-740:	40/20W @ 100v line
Connection		Screw terminals on bottom
Frequency Response		200Hz ~ 14KHz
SPL @1W/1m	CS-720:	90dB
	CS-730:	91dB
	CS-740:	93dB
Dimensions	CS-720:	138(W) x 326(H) x 105(D)mm
	CS-730:	138(W) x 453(H) x 105(D)mm
	CS-740:	138(W) x 580(H) x 105(D)mm
Weight	CS-720:	2.9kg
	CS-730:	3.8kg
	CS-740:	4.6kg

Bracket Assembly:



CS-820 / CS-840: Column Loudspeaker

Extremely robust loudspeaker for installation in both indoor and outdoor applications. Manufactured from aluminium extrusion with a steel grille, the loudspeaker/drivers are proofed to withstand damp environments, and can be used in indoor or protected outdoor installations.

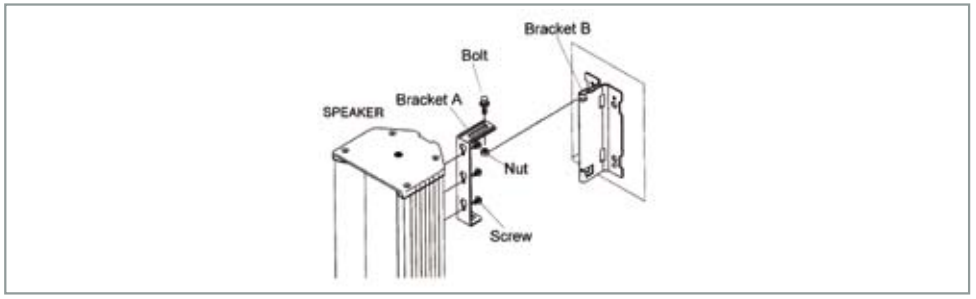
Features:

- Proofed drivers/loudspeakers
- Robust construction
- Multi-position mounting bracket
- 100v Power taps (rated and ½ power)
- Screen terminal connection
- Conforms to IP-54

Specifications:

Model:		CS-820/840:
Power/Taps	CS-820:	20/10W @ 100v line
	CS-840:	40/20W @ 100v line
Connection		Screw terminals on bottom
Frequency Response		200Hz ~ 22KHz
SPL @1W/1m	CS-820:	95dB
	CS-840:	99dB
Dimensions	CS-820:	149(W) x 420(H) x 124(D)
	CS-840:	149(W) x 640(H) x 124(D)
Weight	CS-820:	3.6kg
	CS-840:	5.4kg

Bracket Assembly:



CS-920 / CS-930 / CS-940: Slimline Column Loudspeakers

Attractive slimline column loudspeakers for installation in church, conference and hall environments. These models are also ideal for installation in audio visual applications, when placed either side of a projector screen or plasma/LCD screen. Finished in matt white, the units also feature perforated steel grille and are supplied with multi-position wall bracket.

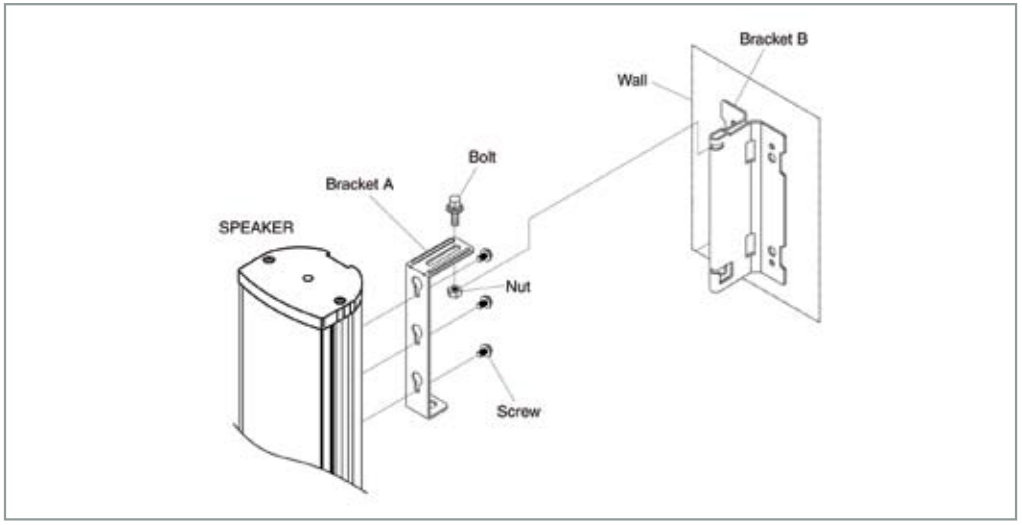
Features:

- Attractive slimline design
- Multi-position bracket
- 100v Power taps (rated and ½ power)
- Screen terminal connection

Specifications:

Model:	CS-920:	CS-930:	CS-940:
Power/Taps	20/10W @ 100v line	30/15W @ 100v line	40/20W @ 100v line
Connection	Screw terminals on bottom	Screw terminals on bottom	Screw terminals on bottom
Frequency Response	250Hz ~ 14KHz	250Hz ~ 14KHz	250Hz ~ 14KHz
SPL @1w/1m	90dB	91dB	93dB
Dimensions	104(W) x 478(H) x 86(D)mm	104(W) x 656(H) x 86(D)mm	104(W) x 834(H) x 86(D)mm
Weight	2.5kg	3.6kg	4.7kg

Bracket Assembly:



HS-20 / HS-S20: Horn Speakers

For use in environments where clear, precise voice messages, announcements or emergency tones or signals are required. The HS-20/HS-S20 horns can be used in indoor or protected outdoor installations.

Features:

- Re-entrant horns
- Metal/ABS construction
- Indoor and protected outdoor use
- 100v Line operation
- Power taps 20W/10W
- Conforms to IP-54

- HS-20

- HS-S20

Specifications:

Model:		HS-20/HS-S20:
Power/Taps		20/10W @ 100v line
Connection		Multicore cable
Frequency Response		380Hz ~ 6.5KHz
SPL @1W/1m		106dB
Dimensions	**HS-20:** **HS-S20:**	250 Ø x 280(D)mm 169 Ø x 230(D)mm
Weight	**HS-20:** **HS-S20:**	2.5kg 1.5kg

CH-522: Music Horn Loudspeaker

The CH-522 can be used in areas where high quality voice and music reproduction are required; for example, distribution centres, production areas and leisure applications. Proofed for outdoor use, the CH-522 can be used in protected outdoor installations such as garden centres, town centres and rail/bus terminals, etc.

Features:

- Modern design
- Indoor/outdoor mounting
- Full range driver/loudspeaker
- 100v Line taps (rated and ½ power)
- Universal mounting bracket
- Conforms to IP-54

Specifications:

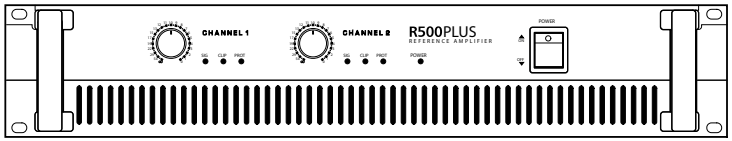
Model:	CH-522:
Power/Taps	20/10w @ 100v line
Connection	Multicore Cable
Frequency Response	110Hz ~ 20KHz
SPL @1w/1m	95dB
Dimensions	294(W) x 209(H) x 326(D)mm
Weight	3.5kg

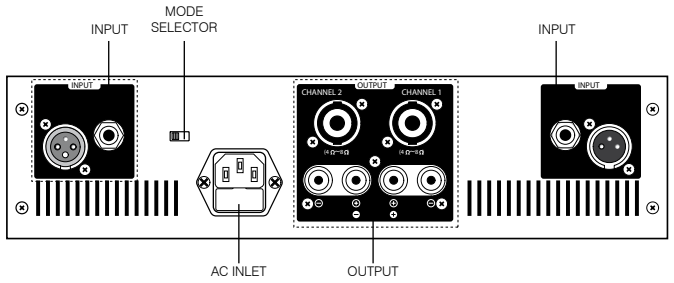
R150+ / R300+ / R500+: Reference Series Low Impedance Amplifiers

A series of 2 channel, convection-cooled (no fans) low impedance amplifiers. The units are ideal for 'silent' systems in church, audio visual and recording studios, etc. Simple controls and visual clip/signal/ protection LEDs complete a versatile, cost effective package.

Features:

- Convection cooled
- Stereo operation (4/8Ω)
- Bridged mono operation (8Ω)
- Inputs (XLR~¼" jack)
- Outputs (speakon~binding posts)
- Mains powered
- 2U high, 19" rack mounting





Specifications:

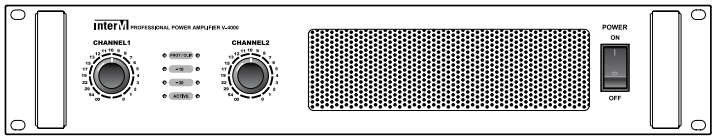
Model:	R150+:	R300+:	R500+:
Output Power/Per Channel	50W @8Ω, 75W @4Ω	100W @8Ω, 150W @4Ω	160W @8Ω, 250W @4Ω
Output Power/Bridged Mono	150W @8Ω	300W @8Ω	500W @8Ω
Input/Sensitivity	0dB/0.775mV	0dB/0.775mV	0dB/0.775mV
Frequency Response	20Hz ~ 20KHz	20Hz ~ 20KHz	20Hz ~ 20KHz
Power Requirement	230V AC 50Hz	230V AC 50Hz	230V AC 50Hz
Dimensions	482(W) x 88(H) x 317(D)mm	482(W) x 88(H) x 317(D)mm	482(W) x 88(H) x 317(D)mm
Weight	7.2kg	8.4kg	10.4kg

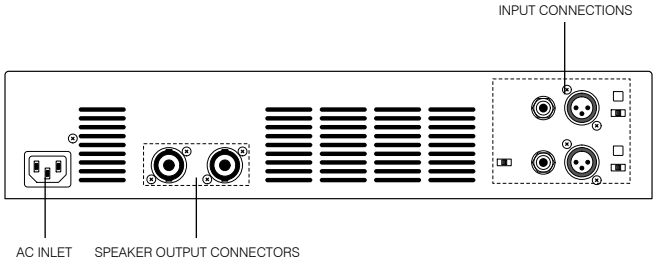
V-3000 / V-4000:
Professional Low Impedance Amplifiers

High quality professional power amplifiers ideal for most low impedance systems and applications. Combining compact size with power and flexibility, the V Series will operate down to 2Ω, and is further enhanced with comprehensive protection circuits for over-driving, DC and short circuit, as well as variable fan cooling.

Features:

- Variable fan cooling
- Comprehensive protection circuits
- Low impedance output (2/4/8Ω)
- Bridge mono option
- Balanced inputs (XLR~¼" jack)
- Outputs (speakon~binding post)
- Mains powered
- 2U high, 19" rack mounting





Specifications:

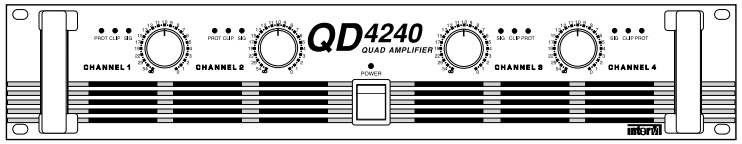
Model:	V-3000:	V-4000:
Output Power/Per Channel	550W @8Ω, 1000W @4Ω, 1650W @2Ω	750W @8Ω, 1300W @4Ω, 2100W @2Ω
Output Power/Bridged Mono	2000W @8Ω, 3300W @4Ω	2600W @8Ω, 4200W @4Ω
Input/Sensitivity	0.94v~1v	1.04v ~ 1.14v
Frequency Response	20Hz ~ 20KHz	20Hz ~ 20KHz
Power Requirement	230v AC 50Hz	230v AC 50Hz
Dimensions	482(W) x 88(H) x 407(D)mm	482(W) x 88(H) x 407(D)mm
Weight	11.7kg	11.8kg

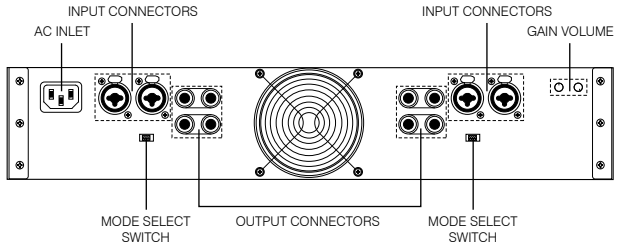
QD-4240 / QD-4480 / QD-4960: 4 Channel Low Impedance Amplifiers

Ideal products if space is a premium, or if the system requires multiple zones or individual control of loudspeakers. Units can operate as 4 individual channels or as 2 stereo (2 channel) amplifiers. Features include a delayed switch-on function, protection circuits for overdriven, overheating and DC detection, as well as variable speed fan cooling, all in a compact 2U enclosure.

Features:

- 8Ω or 4Ω low impedance
- Fan cooled (variable speed)
- Inputs (XLR~¼" jack)
- Outputs (Binding post)
- LED indicators for clip/protection/signal
- Mains powered
- 2U high, 19" rack mounting





Specifications:

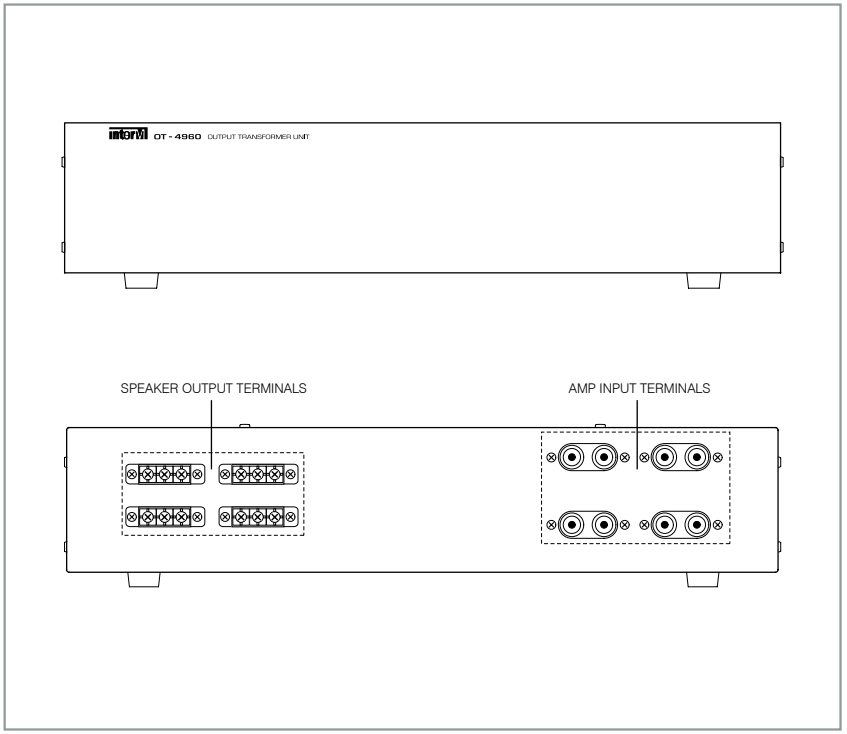
Model:	QD-4240:	QD-4480:	QD-4960:
Output Power/Per Channel	40W @8Ω, 60W @4Ω	80W @8Ω, 120W @4Ω	170W @8Ω, 240W @4Ω
Output Power/Bridged Mono	120W @8Ω	240W @8Ω	480W @8Ω
Input/Sensitivity	0dBm / 20kΩ Balanced	0dBm / 20kΩ Balanced	0dBm / 20kΩ Balanced
Frequency Response	20Hz ~ 50KHz	20Hz ~ 50KHz	20Hz ~ 50KHz
Power Requirement	230v AC 50Hz	230v AC 50Hz	230v AC 50Hz
Dimensions	482(W) x 88(H) x 369(D)mm	482(W) x 88(H) x 369(D)mm	482(W) x 88(H) x 369(D)mm
Weight	11.5kg	15.5kg	17kg

OT-4240 / OT-4480 / OT-4960: Transformer Converters for QD Amplifiers

Useful accessory for converting the 4 channel QD Series to power 100v line loudspeakers, offering space-saving benefits for amplifier systems with multiple loudspeakers or zones with small quantities of speakers.

Features:

- 4 x 100v Transformers
- Inputs (binding posts)
- Outputs (screw terminals)
- 2U high, rack mounting



Specifications:

Model:		OT-4240/OT-4480/OT-4960:
Output Power/Per Channel	**OT-4240:**	60W 100v / 166.7Ω
	OT-4480:	120W 100v / 83.3Ω
	OT-4960:	240W 100v / 41.6Ω
Input Power / Impedance	**OT-4240:**	60W @ 4Ω
	OT-4480:	120W @ 4Ω
	OT-4960:	240W @ 4Ω
Dimensions	**OT-4240:**	482(W) x 88(H) x 310(D)mm
	OT-4480:	482(W) x 88(H) x 310(D)mm
	OT-4960:	482(W) x 132(H) x 310(D)mm
Weight	**OT-4240:**	11.5kg
	OT-4480:	14.5kg
	OT-4960:	21.5kg

Installation Advice & Information

Inter-M - The Industry Standard for Commercial Sound

Inter-M provide a range of specially-developed installation loudspeakers for indoor and outdoor PA applications.

Designed to achieve optimum voice/BGM clarity in a wide range of commercial applications, Inter-M speakers continue to be specified into many of the UK's leading PA installations.

The basic principles of effective surface-mount ceiling loudspeaker installation

The first priority of a high quality sound reproduction system is that of providing listeners with an acoustic level higher than that of any possible background noise. The system must simultaneously ensure a wide frequency range and maximum intelligibility. It should also guarantee a flat frequency response and uniform sound pressure level to give optimum listening pleasure and clarity. To meet these criteria, the hypothetical ideal solution would be to place each sound source at an equal distance from all required listening points.

Ceiling-mounted Loudspeakers

In environments offering suitable ceiling height, this 'hypothetical' ideal standard can be approximated by using loudspeakers with very wide frequency response and dispersion angles which remain consistent at different frequencies, arranged in a ceiling or 'shower'-type configuration.

This provides the following acoustic benefits:

- Maximum sound distribution uniformity
- Maximum speech intelligibility
- Constant quality of music reproduction
- Reduced reverberation in the environment
- Sound source remains at a constant distance from the listening position

Once the required loudspeaker type has been chosen and the characteristic parameters considered (eg. dispersion angle, room shape and size), the number of loudspeaker units needed to obtain constant and uniform sound dispersion can easily be calculated. The required speaker quantity is calculated by dividing the floor area in square metres by the area of coverage of each loudspeaker on the listening plane.

[**Figure 1 clearly illustrates this concept**]

Wall-mounted Loudspeakers

If the architectural features of the room are not compatible with ceiling-mounted loudspeakers or if a wall-mounted solution is preferred, it is essential to observe a few basic rules to obtain the most effective sound distribution. In order to maintain the most efficient listening point inside the direct signal area, both in-wall and surface mounted loudspeakers with power from 6 to 20W should be installed at a height between 2 and 2.5m.

The maximum distance between adjacent loudspeakers must be no more than 5~6 metres along the length of the room, where the room is no wider than 4~5 metres.

For wider rooms (eg, 8~10 metres), it is recommended to install loudspeakers in an alternate pattern along both opposite walls, to provide adequate coverage and maintain sound pressure at the best possible constant level throughout the area for coverage.

[see Figures 2 and 3]

Corridor/Tunnel: Area Coverage

For effective sound distribution in corridors, tunnels or passenger platforms in railway/underground stations, horn speakers (A) are normally specified for increased voice clarity in these high ambient noise conditions. For higher quality sound reproduction, 'sound projectors' can be used as an alternative.

In all cases, these loudspeakers must be installed at a maximum distance of 15 metres from one another, mounted all in the same direction and in observance with the phase of each loudspeaker. Alternatively, bi-directional versions (B) of these loudspeakers can be considered, positioned at a maximum of 30 metres apart (again observing phasing).

[see Figure 4]

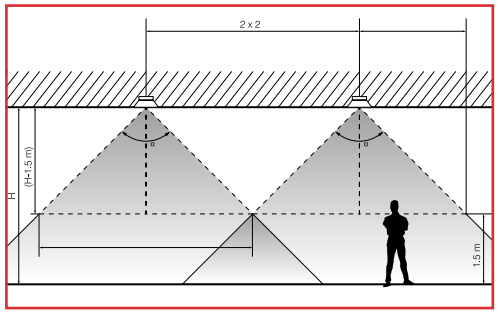


Figure 1

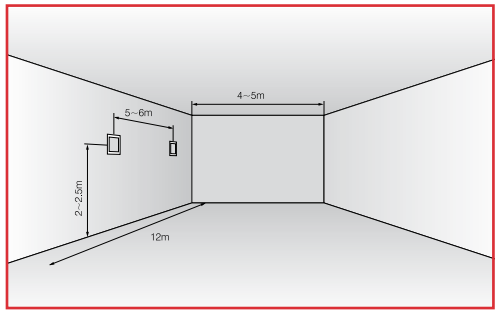


Figure 2

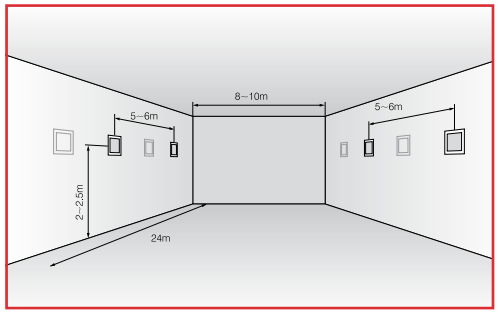


Figure 3

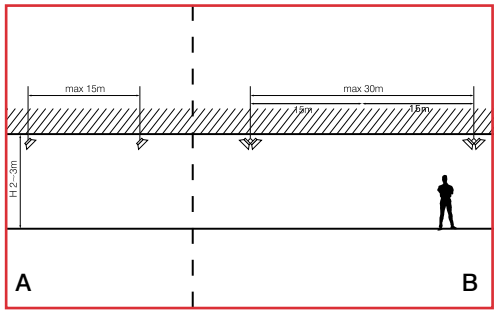


Figure 4

Degrees of protection (I.P. rating)

The characteristics of a product in terms of its resistance to the penetration of solid objects and liquids is indicated by the letters IP (International Protection) followed by two numbers in accordance with EN standards 60529-CEI 70-1.

IP degree of protection

- The first number identifies the level of protection against the ingress of solid objects. Number from 0 to 6.
- The second number identifies the level of protection against penetration of liquids. Number from 0 to 8.

First IP number:

0 Not protected
1 Protected against the ingress of solid objects larger than 50mm
2 Protected against the ingress of solid objects larger than 12mm
3 Protected against the ingress of solid objects larger than 2.5mm
4 Protected against the ingress of solid objects larger than 1mm
5 Protected against dust penetration
6 Totally dust-proof

Second IP number:

0 Not protected
1 Protected against vertically dripping water
2 Protected against water dripping at an angle (up to 15° from the vertical)
3 Protected against rain
4 Protected against water spray
5 Protected against water jets
6 Protected against waves
7 Protected against the effects of temporary immersion
8 Protected against the effects of permanent immersion

Speakers, Decibels, SPL

Lose 6dB each time distance is doubled from speaker	Add 3dB when power is doubled		
Distance from speaker:	**1m**	**2m**	**3m**
SPL(dB)@1W	95	89	83
SPL(dB)@2W	98	92	86
SPL(dB)@4W	101	95	89
SPL(dB)@8W	104	98	92

Quantity of Ceiling Speakers per Sq/metre for background music

Ceiling Height = 2.5m	Speaker Spacing = 5m	Coverage = 25Sq.m
Floor Area:	**Quantity of Speakers:**	**Wattage Taps in Area**
100 Sq.m	4 x Speakers	Quiet 55dB Tap @1W
250 Sq.m	10 x Speakers	Normal 60dB Tap @2W
1000 Sq.m	40 x Speakers	Noisy 65dB Tap @3W

Low Impedance and 100v Line Systems

Constant impedance lines (low impedance) are used normally in the case of a low number of loudspeakers, placed at a minimum distance from the amplifier (<20m).

The constant voltage connection system (e.g. 100V line) offers a host of advantages making it ideal for sound systems of all sizes, above all in the case of long distance speaker runs. This connection system requires each loudspeaker to be equipped with its own line transformer, which adapts the impedance of the loudspeaker (usually very low) to the much higher level of the line itself. In proportion to power transmitted, the current circulating on a line at 100V is considerably lower than that circulating on wires of a constant impedance system and, consequently, drops along the line are less frequent; therefore the cable gauge can be lower.

The function of the amplifier device is **to raise the signal of a sound source**, such as a microphone, CD player, cassette recorder or an AM/FM tuner **to a sufficient level to pilot the transducer LOUDSPEAKER**. The amplifier has several inputs, to which the various sound sources are connected.

The sound sources have to be mixed (mixer) and acoustically modified with tone control and equalisers to optimise listening in relation to the environment's characteristics. A terminal board is also fitted on output indicating impedance and voltage to which the loudspeaker line is connected.

A few basic rules must always be observed:

1. When the load is on 'constant impedance'; must be connected to the relative socket.

For example, a load of 4Ω must be connected to a socket marked 4Ω, and so on. The power that the load can withstand must always be greater than the amplifier's rated power.

For example in the case of a load of 100W, the amplifier must have a power equal to or less than 100W.

2. When the load is at 'constant voltage'; must be connected to the sockets indicating output at constant voltage - 50, 70 or 100v; the power that the load can withstand must always be less than or equal to the amplifier rated power. For example, with a load of 100W, the amplifier must have a power equal to or greater than 100W.

To calculate the required value of a 100v line amplifier power, simply add together the power of each loudspeaker. (See Figure 5).

However, on a constant impedance system, the load must have an equivalent impedance (series/parallel) equal to or greater than the minimum value indicated on the amplifier output (See Figure 6).

The loudspeaker power supply lines, with no connected attenuator, must be with 2 sheathed wires; cables with 3 sheathed wires are required in the case of lines using attenuators which can be disabled if an emergency is activated. Adequate wire sections are required:

1.5mm² for lines up to 500W power, 2.5mm² for lines with power over 500W. The following general standards must also be observed:

- Never use a single cable (lead) for loudspeaker connections: this would cause disturbance producing a loud 'HUM'
- Never use shielded cables for the loudspeaker connections: this would cause serious damage to the power units.

100v Line Speaker Load

Amplifier power should be equal to or greater than the total speaker load (preferably leaving approx. 20% available power, where possible).

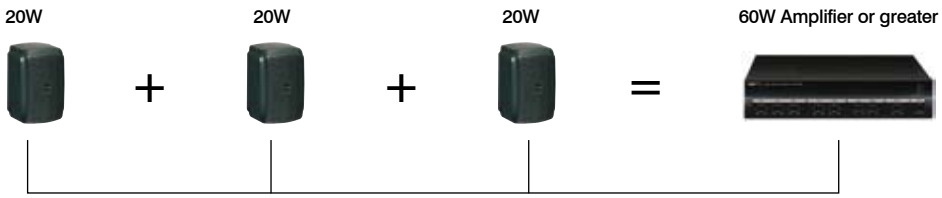


Figure 5

Low Impedance Speaker Load

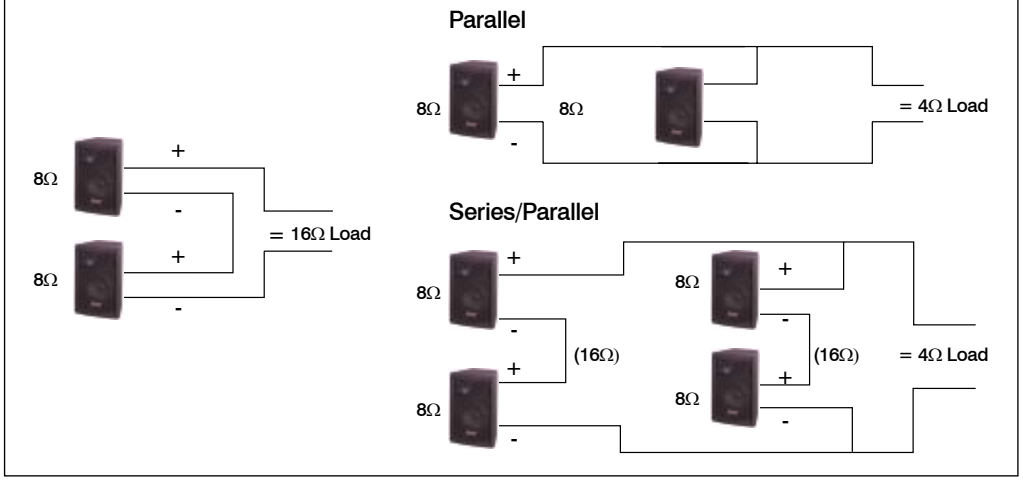


Figure 6

Dedicated Rack Design & Build Facility

For many years, our customers have also benefited from our comprehensive Inter-M Rack System Design & Build Service, to provide 'ready to install' PA, VA and AV Racks in some of the UK's largest and most successful installations.

Using our extensive portfolio of Inter-M products, our highly skilled, UK-based Engineering Team have a reputation for consistently producing some of the UK's highest quality, ready-to-install PA rack systems to customers' specifications.

There is no set limit to the size of system we can produce; anything from a small single zone speech-only system, to a multi-zone system combining speech and music. Monitoring and battery back-up can also be accommodated by our in-house Engineering Facilities.

To ensure that we build your system to your specific requirements, we have produced a technical questionnaire which, once completed by yourselves or with our assistance, outlines requirements such as number of zones, music sources, number of microphones, etc.

Each system is supplied assembled, wired and fully tested before leaving our workshops. As part of the Build Package, each System is supplied with a comprehensive operations manual incorporating user instructions for each individual piece of equipment, a schematic drawing of the System, a visual of the Rack layout and easy to use connection details. Finally, each System is given a unique identification number specific to your installation which allows our Engineering Team to easily identify any system we have assembled, to efficiently assist with any after sales service requirements.

Call the CIE-Group sales desk or your area representative on 0115 9770075 for advice, free UK site surveys and a highly competitive quotation.

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